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ABSTRACT

This publication is a part of a series of materials in the Wildlife Education Service for Kansas youth series. The goal of the program is to provide information about wildlife and to establish in children an awareness and appreciation of wildlife. A booklet for children and a teacher's guide are included. The booklet was written for sixth-grade children but can be easily adapted for other grades. The materials are designed for multidisciplinary use. The teacher's guide includes the following materials: (1) an introduction and foreword; (2) an opinionnaire about the materials; (3) a student award form; (4) ideas for classroom bulletin boards; (5) reproducible worksheets for students; (6) supplemental activities and approaches for language arts, science, art, industrial arts, mathematics, social studies, music, and physical education; and (7) appendices which list resources and references, and include a glossary of terms used in teaching this topic. (CW)

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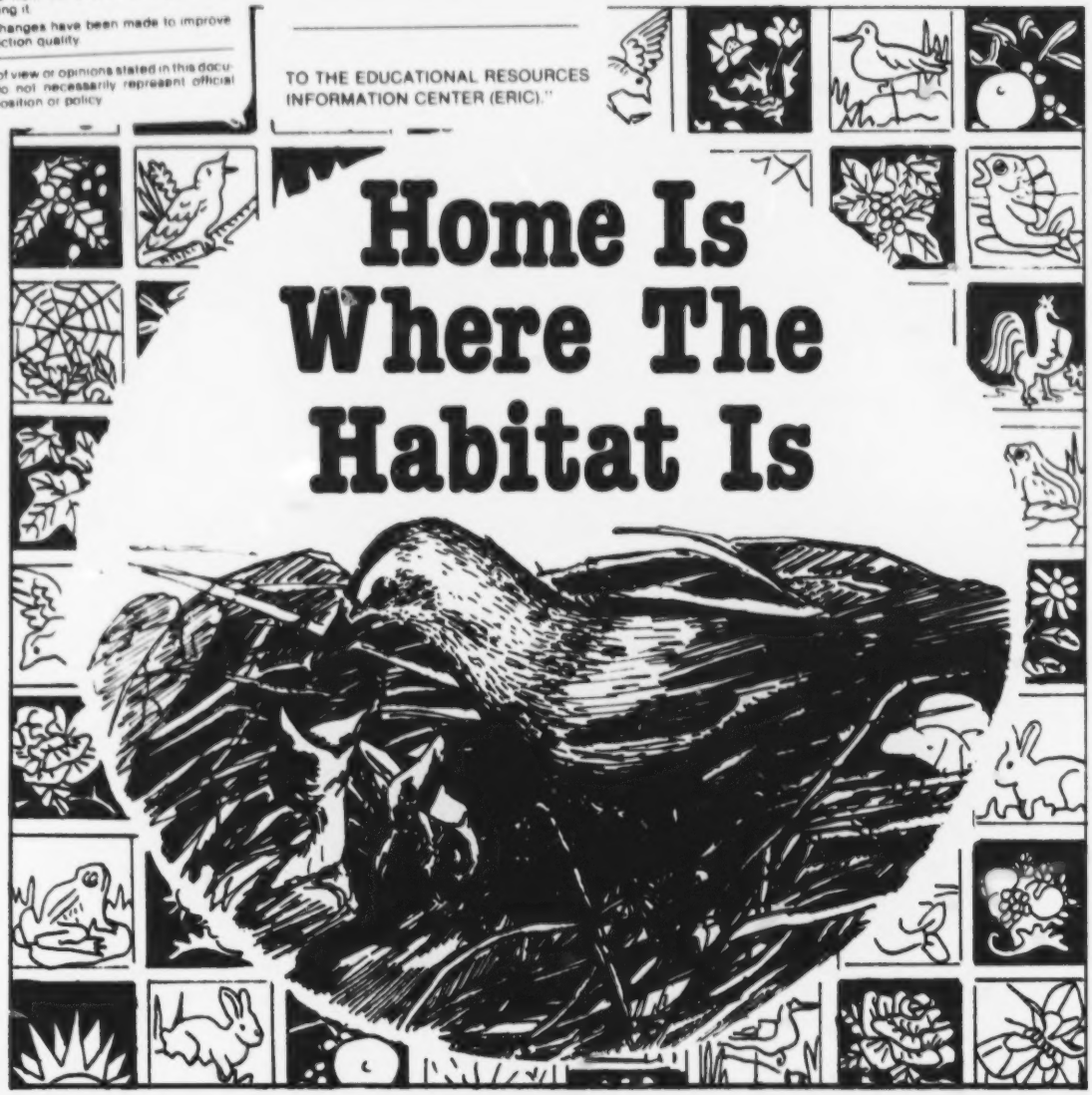

Teacher's Guide

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Teacher's Guide

Home is Where the Habitat is

Comprehensive Program Written and Developed by

Joyce R. Harmon

Wildlife Education Coordinator

Design and Illustration by

Mike Miller

With special thanks to Debbie Schmidt and Alan Baccarella

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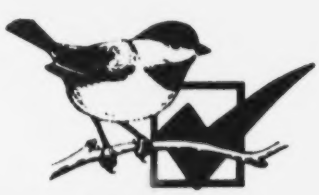
KANSAS FISH AND GAME

A series of wildlife education materials for Kansas youth from Kansas Fish and Game

THIS MATERIAL IS DEDICATED TO THE CHILDREN OF KANSAS; MAY THEY KNOW A LOVE OF WILDLIFE.

Funded by hunting and fishing license fees and the Nongame Wildlife Tax Check-Off Program

Wildlife Education Service
Kansas Fish and Game Commission
Box 54A Route 2
Pratt, Kansas 67124



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HOME IS WHERE THE HABITAT IS

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Introduction

HOME IS WHERE THE HABITAT IS is part of a series of materials in the Wildlife Education Service for Kansas youth from Kansas Fish and Game Commission. (See inside cover of the student booklet for other titles.) The material is designed for use by teachers. The goal of the program is to provide information about wildlife and to establish in children an awareness and appreciation of wildlife. This booklet was written for **sixth grade** but can be easily adapted for other grades. The study of wildlife need not be limited to science class but should be multidisciplinary. Enrich your existing curricula with this material.

You do not have to be a biologist or wildlife expert to teach about wildlife. The Wildlife Education Service materials were written for anyone who has an interest in teaching children about wildlife and the environment. The worksheets and activities in the teacher's guide reinforce information in the student's booklet. Do any quantity or combination of activities and worksheets that are appropriate for your schedule. The lessons may be used as a unit of study or used throughout the year when time allows. The worksheets may be done in whatever sequence you choose.

ONE set of each grade's materials will be provided to each school to be shared among the teachers at that grade level. Maintain these materials for future year's use. This is a master copy. Replacements are not available. The materials may be reproduced if additional copies are needed or you choose to have copies for students to take home.

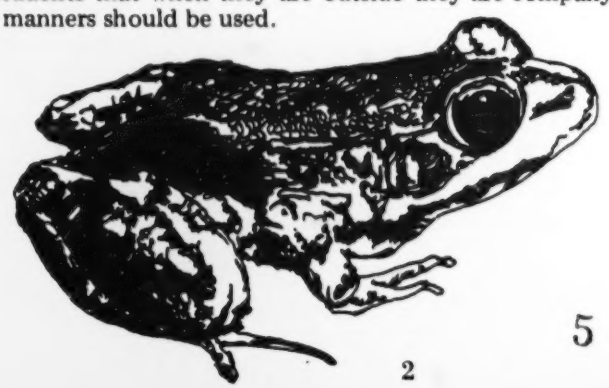
The Fish and Game Commission has a Wildlife Reference Center located at the Pratt headquarters. The center includes films, filmstrips, slide series, games, posters, books, and other wildlife-related material available to schools on a free-loan basis. Return mail cost is the only expense to the school for use of this material. Refer to your Wildlife Reference Center catalog for materials appropriate to your study. Especially recommended for use with this booklet are: M-70, Habitat-A Special Place; M-64, A Place To Live; M-63, A Prairie Should Be Forever; M-20, America's Wetlands; M-7, An American Heritage; M-51, Future of Wildlife; SS-28, Kansas Wildlife and Their Habitats; FS-6, Room to Live; FS-19, Protective Adaptations in Animals; FS-9, Exploring Ecology; M-75, Spring Comes to the Pond; FS-36 and SS-7, Water: We Can't Live Without It; SS-5, Sharing Our Land With Wildlife; GK-16, Duck Hunter's Game; 12-6, Homes for Wildlife; FS-33, This Is Your Land; FS-34, Discover Wildlife In Your Backyard. Be sure to check your Wildlife Reference Center catalog for other materials. A catalog has been sent to each school district office. Please contact your administration office for your district's copy. Orders will be filled on a first-come, first-served basis, so we suggest sending your requests in early.

To be effective, material must be used. This format was written to be easy to use, ready to use, and flexible. Little additional preparation or equipment is required. The most important ingredients for success in your lessons will be your enthusiasm and imagination. Technical references can be obtained from the Wildlife Reference Center or your local library.

The material is appropriate throughout Kansas, no matter what size community or region of the state you live in. It is not necessary to have a natural area near your school; use whatever is available. Many of the supplementary activities can be done on the schoolgrounds or in the classroom.

This program was funded by hunting and fishing license fees and, in part by the Nongame Wildlife Tax Check-off Program.

Remind your students that when they are outside they are company in the homes of wildlife; therefore, their best manners should be used.



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Foreword

In the time I have spent in Kansas, I have learned to appreciate the state that was once described as the great American desert. Kansas remains one of the better-kept secrets in the United States. The diversity of climate, terrain, and vegetation provides for a variety of wildlife. Use these attributes to the fullest in your classroom. Students are already interested in animals; tap that interest in all curricula areas by exploring what Kansas wildlife has to offer. Wildlife is a basic now more than ever. People, especially children, need to be more aware of wildlife and how their actions affect wildlife. The future of wildlife depends on actions we make today. Educate our young people to care about their future and the future of wildlife.

Please direct any questions or comments concerning the Wildlife Education Service materials to me at the Pratt headquarters. Good luck for a successful and exciting learning experience.

Joyce Harmon

Joyce R. Harmon
Wildlife Education Coordinator
Kansas Fish & Game Commission
RR 2 Box 54A
Pratt, Kansas 67124

A true conservationist is a man who knows that the world is not given by his fathers, but borrowed from his children. —*John Madson*

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Opinionnaire

Your input is important in continuing and improving this program. Any comments or ideas you want to share would be appreciated. Please make a copy of the opinionnaire below and complete it or send your suggestions on a separate sheet to:

Joyce R. Harmon, Wildlife Education Coordinator
Kansas Fish and Game Commission
RR 2 Box 54A
Pratt, Kansas 67124

Title of unit_____ Grade you teach_____
School district_____

The materials were:
_____ very useful _____ moderately useful _____ of no use

Students were:
_____very interested _____moderately interested _____not interested

The materials were appropriate for the grade you teach. ( ) yes ( ) no
(if no, list more appropriate grade)_____

Rank each of the following components on a scale of 1 to 5 based on their value for your use. (1 represents highest grade; 5 represents lowest grade)

_____ student booklet
_____ bulletin board idea
_____ student award
_____ worksheets
_____ supplementary activities & approaches
_____ glossary
_____ resources & references
_____ Wildlife Reference Center

List favorite worksheet (s) or activity (ies)

List curricula areas where you used the material

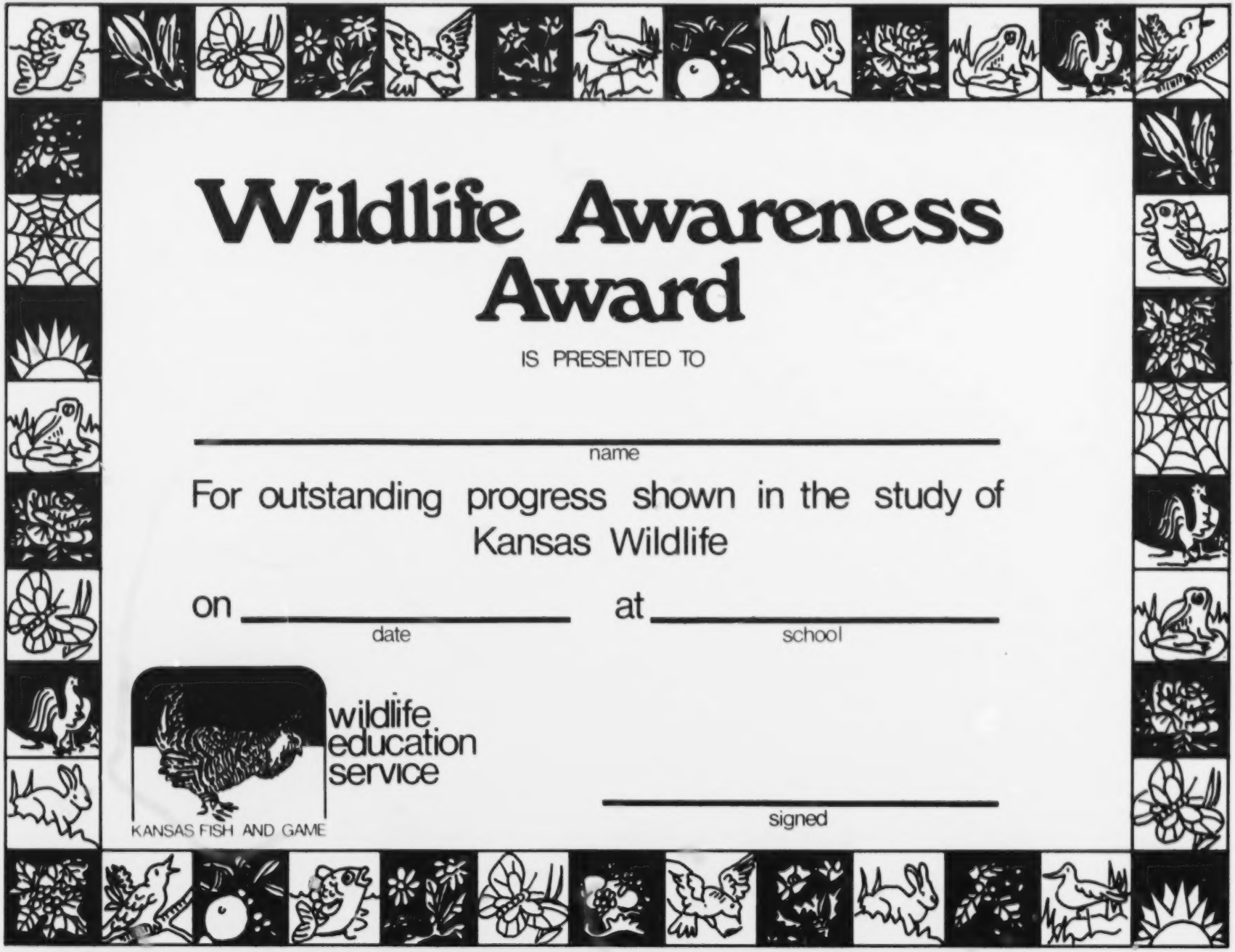
Approximate amount of time (hours, days) spent using the material

Changes you would recommend. Please be specific.

Other comments

Thank you for your time and effort.

After students have successfully completed their study of this aspect of wildlife, award their progress. Copies can be made of this award and presented to them at the end of your unit of study.



Wildlife Awareness Award

IS PRESENTED TO

_____
name

For outstanding progress shown in the study of Kansas Wildlife

on _____ at _____
date school

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_____
signed

motif by Daisy Baughman

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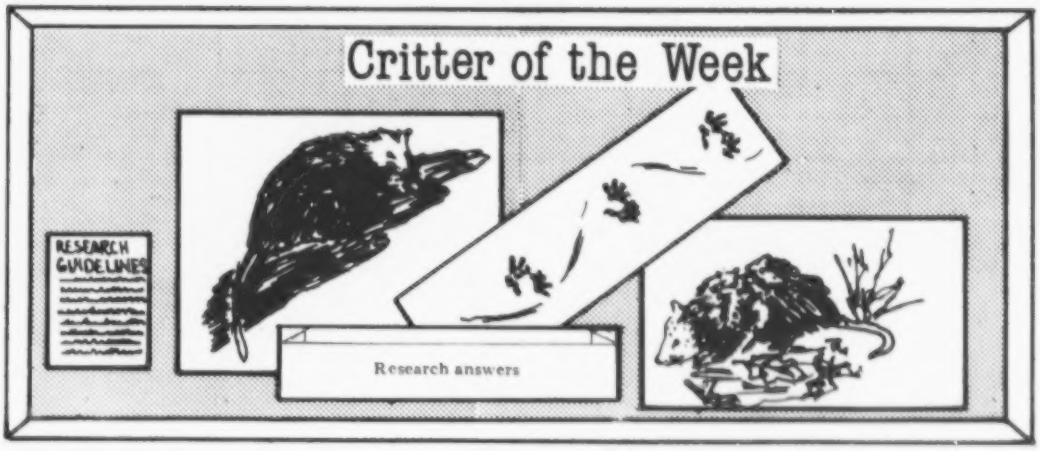
BULLETIN BOARD IDEAS

CRITTER CURIOSITY



On a bulletin board or study center, set up an ongoing wildlife investigation. Choose pictures of a particular species in different poses and stages of development if possible. Students research this animal in order to answer the following questions of your choice.

What is the animal's name? (Give scientific name and common name.)
How would the animal be classified? (mammal, fish, reptile, amphibian, bird, insect, etc.)
In what habitat would this animal live?
Is the animal an herbivore, carnivore, or omnivore?
What does the animal eat?
Is it a predator or prey? What preys upon it?
What shelter (cover) does it need?
Does it hibernate, estivate, or migrate? (If so, when and where?)
Is it nocturnal or diurnal?
Is it a scavenger, decomposer, or consumer?
What does it need to survive?
What is the average number of young it has each year?
What is the average life span?
Add any other facts you can find that would interest the class.

At the end of a previously set period of time, collect the research and discuss the results with the class. Select a new animal or have an interested student make the selection.

Other Bulletin Board Ideas.

Divide a bulletin board into four habitats: forest, prairie, marsh, lakes, and rivers. Select pictures for the background that represent each habitat. Have students draw or cut out pictures of animals that are appropriate for each habitat and add them to the bulletin board.

An alternative is to have pictures of animals around the edge of the board. Students match the wildlife to the habitat by a connecting string and tack.

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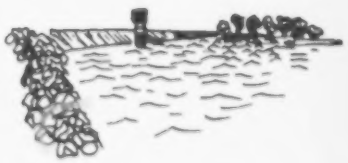
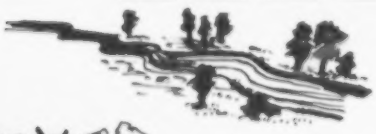
Name That Habitat

Directions:
Fill in the blanks with a kind of habitat.





1. □□□□H
2. □A□□
3. □□□□□□□I□
4. □T□□□□
5. □□A□□□□
6. □□□□□T

Describe each habitat in the spaces below.

1.

2.

3.

4.

5.

6.

Name at least one animal that would be found in each habitat.

1.

2.

3.

4.

5.

6.

List at least two additional ways that habitat can be improved and managed for wildlife.

1. Plant trees and shrubs that are good wildlife food and cover.
2. Fire.
3. Build nesting platforms and nesting boxes.
4.
5.

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HABITAT MATCHUP

Match the wildlife species with the habitat in which they would most likely be found. You may use the encyclopedia or other research materials to find the answers. Some have more than one answer. Check your work.

A) Prairie

B) River, lake or reservoir

C) Marsh

D) Forest

_____ Channel catfish

_____ Prairie dog

_____ Buffalo

_____ Bluejay

_____ Pileated woodpecker

_____ Raccoon

_____ Grasshopper

_____ Prairie chicken (greater and lesser)

_____ Ring-necked pheasant

_____ Cottontail rabbit

_____ Jackrabbit

_____ Coyote

_____ Topeka shiner

_____ Dragon fly

_____ Pronghorn antelope

_____ Whitetail deer

_____ White-fronted goose

_____ Ornate box turtle

_____ Scissor-tailed flycatcher

_____ Burrowing owl

_____ Bluegill

_____ Plains leopard frog

_____ Swift fox

_____ Beaver

_____ Crayfish

_____ Black-capped chickadee

_____ Otter

_____ Copperhead

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NAME

mapping habitats

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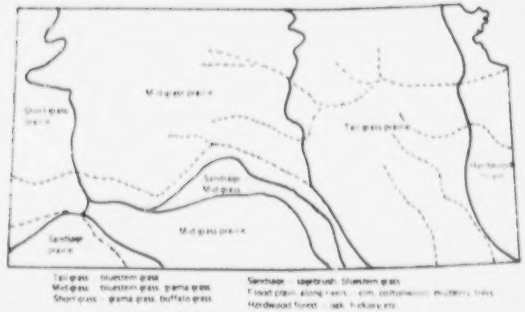
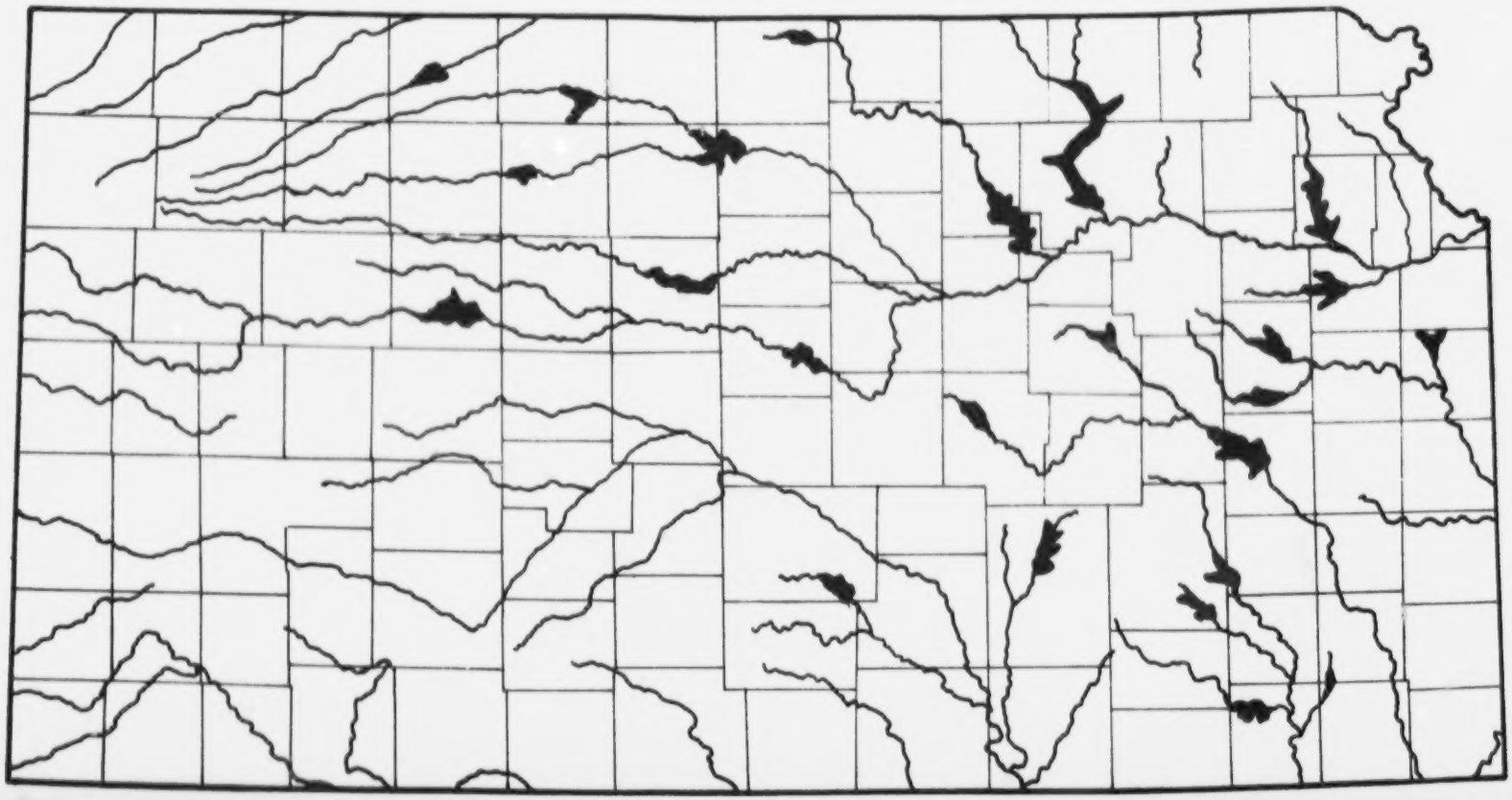
The natural vegetation of Kansas has been changed by people. Farming, mining, and building communities are a few of the ways we have changed the habitat. The small map in the corner shows the potential vegetation of Kansas, if the state had not been settled. Label the kinds of habitat currently found in Kansas. Complete your map with legend, title, and compass rose. Label the town or city in which your school is located. Draw, or write the name of at least three kinds of wildlife you'd find in each habitat type. Remember that trees will also be found along streams and rivers in prairie areas. Label the state capital, at least 20 counties, and at least 15 national, state, or county parks.



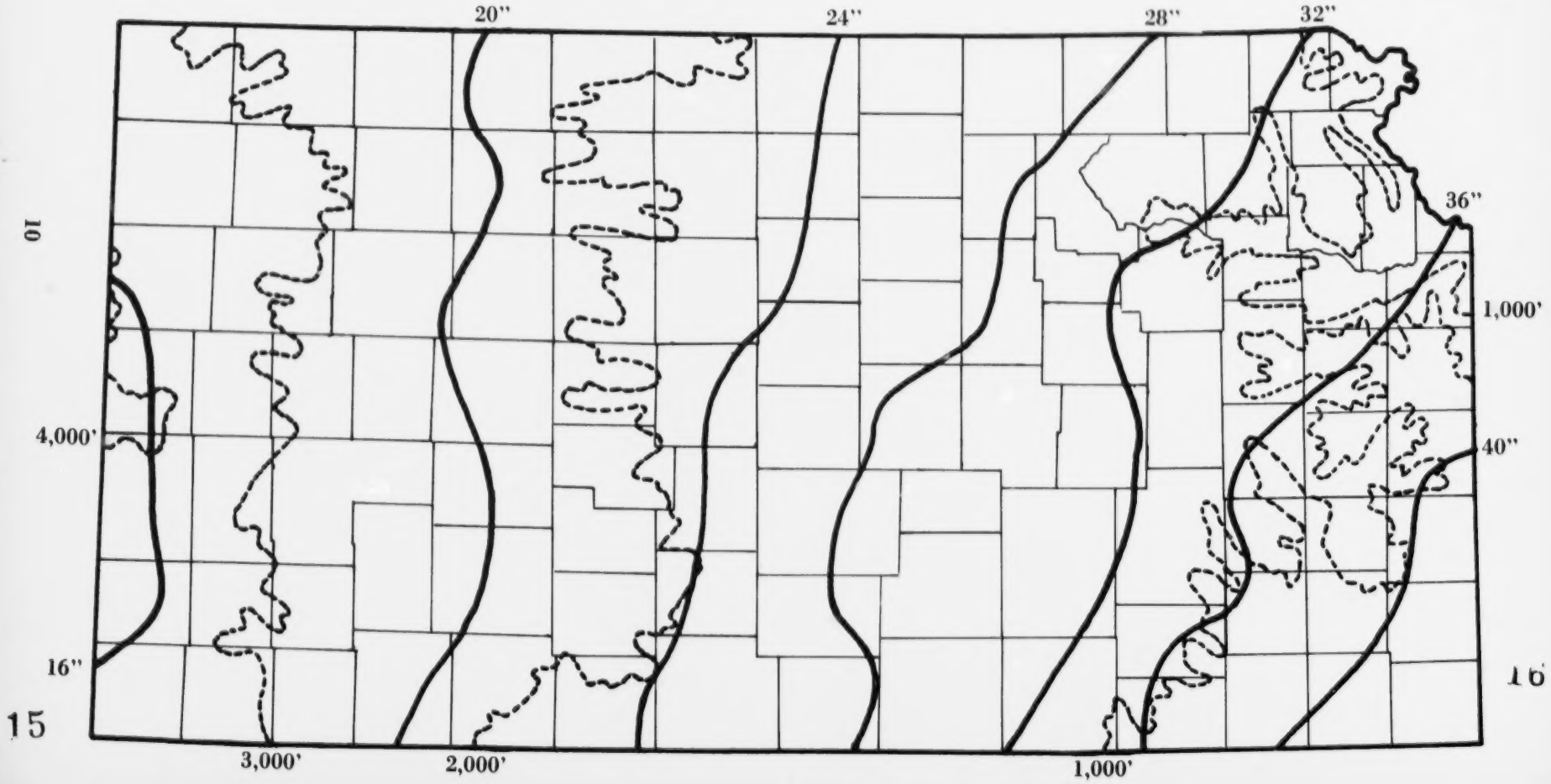
In places where two habitat types meet (the edge), you may find several other plants not listed here and an overlap of vegetation.



NAME _____

RAIN OR SHINE

The kinds of habitat found in different parts of the state depend largely on the amount of rainfall. Use the rainfall information on the map below to show the effect of rainfall on habitat. Draw in boundaries for the major habitats discussed in the booklet. Outline and label your county in red. Check your local weather station for your area's average annual rainfall. The dotted lines mark the elevation of the state. **Elevation** means the height of land above a point called sea level. Is Kansas as flat as people say? Does elevation seem to affect other habitat factors?



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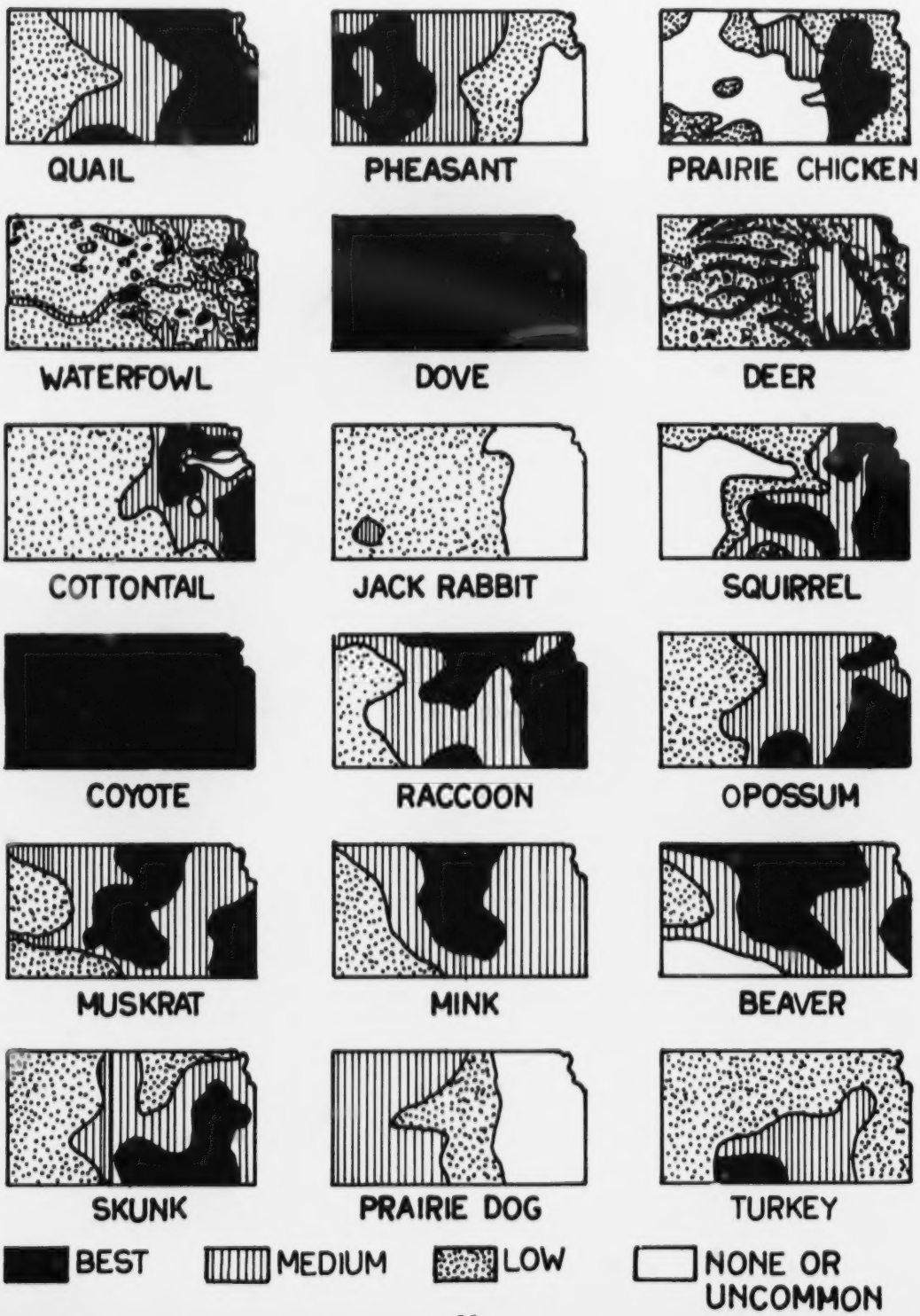
Home on the Range

Directions:

Compare these maps with the rainfall and habitat maps. What do the maps tell you about wildlife and habitat? Enlarge these on transparencies and place the rainfall and habitat maps over them. Make a list of the best habitats for each species.



NAME _____

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NAME _____

HABITAT COMPARISONS

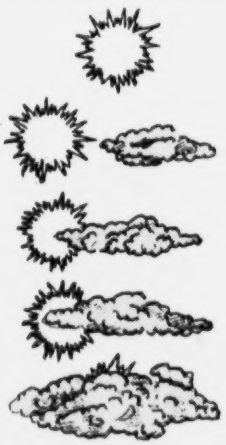
Compare three different habitats near your school. Complete the table below for each habitat by observing the areas.

TYPES OF SOIL

Clay - extra fine soil particles	Silt - fine soil particles	Loam - medium particles	Sand- coarse soil

AMOUNT OF SUNLIGHT

Estimate the proportion of shade to sunlight at each station.



Very sunny – most of the ground surface is covered by sunlight

Sunny – about ¾ of the ground surface is covered by sunlight

Moderately sunny – equal amounts of sun and shade on ground

Shady – about ¾ of the ground surface covered by shade

Very shady – most of the ground surface is covered by shade

	HABITAT 1	HABITAT 2	HABITAT 3
Describe area (type of habitat, etc.)			
Amount of sunlight			
Air/Soil temperature			
Vegetation (plants)			
Type of soil (clay, loam, etc.)			
Soil/Air moisture (dry, slightly moist, etc.)			
Topography (hilly, flat, marshy, etc.)			
Animals (include insects)			
How are plants and animals adapted to this area?		18	

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What did you find that all three habitats have in common?

What animal species are adapted for all three habitats?

Draw a small map of each area. Bring back samples of the most common plants found in each plot.

NAME _____

Adapted from an Illinois conservation education kit.

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GIVE WILDLIFE AN EDGE

Directions:

Good habitat conditions are necessary for good wildlife populations. A mixture of kinds of habitat is called **interspersion** or **edge**. When two or more habitat types meet at an edge, wildlife tends to concentrate there. The edge gives wildlife the bonus of having food, shelter, and water closer to each other – that's called the **edge** effect. Mark an X at each spot where pheasants would choose to live.

LEGEND

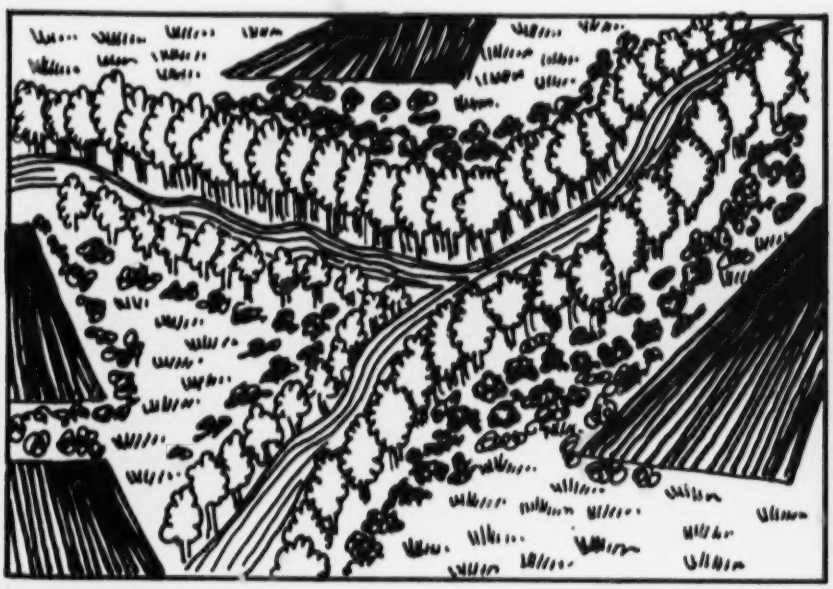
Woodland

Stream

Grassland

Field

Brushland (shrubs)



What kinds of habitat would pheasants choose to live in?

If we changed all the grassland and brushland to cropland, how would we affect the number of pheasants that would live here?

What other kinds of wildlife would you find here?

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SUCCESSION INVESTIGATION

SUCCESSION refers to the gradual and continuous replacement of one plant or animal by another. If your yard was not mowed for a month or more, you would begin to see shrubs growing where grass once was. If left unmowed long enough, your lawn would be replaced by bushes, trees, and shrubs.

One of the steps in succession is **decomposition,** or decay. Find a fallen tree or log to complete this worksheet.

Describe the tree's color, texture, and age.

Estimate how long it has been on the ground.
Circle one: Less than one year five to ten years over ten years

How is the log used by animals and plants in the area?

What evidence can you find of use?

What species of wildlife is present because it makes its home in or near this tree?

What species of plants are present?

List reasons why fallen trees or branches are important to wildlife.

Note other signs of succession around the schoolgrounds. Are there any signs of plants invading an area?

On this sheet or on another sheet of paper, draw three pictures. One picture should show what the tree and surrounding habitat looked like when the tree was living. The second picture should illustrate the current situation, and the third picture should show what you think the fallen tree and nearby area will look like in twenty-five years.

NAME _____

HOME IS WHERE THE HABITAT IS

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You are deciding about the environment

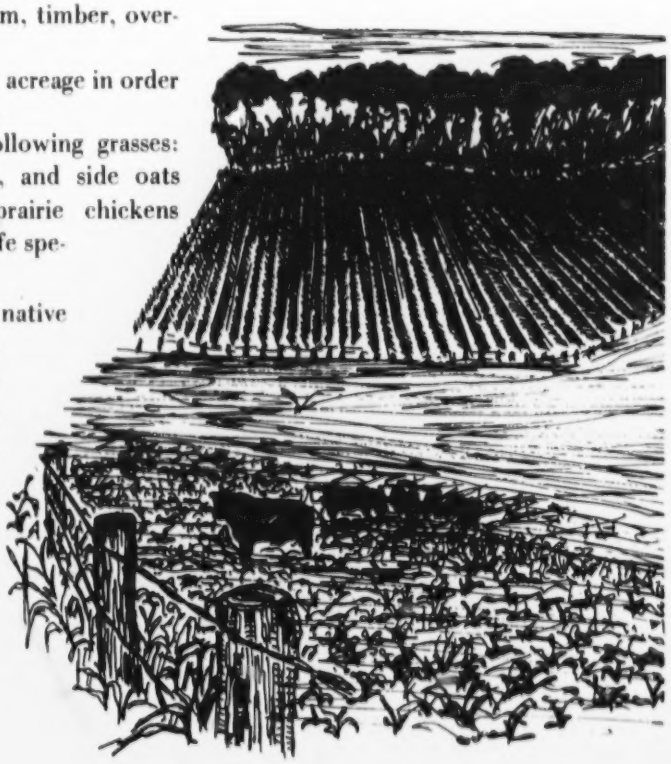
FLINT HILLS' FUTURE

You have inherited 350 acres of land in the Flint Hills of Kansas. Your acreage includes 200 upland acres of native prairie, prime for grazing cattle, and 150 bottomland acres. The 150 acres includes a stream, timber, overgrown cropland, and fields suitable for corn and alfalfa.

The will states that you are to take an inventory of the acreage in order to determine the most *suitable* and *valuable* uses of the land.

The upland, native, tallgrass prairie includes the following grasses: big bluestem, little bluestem, Indian grass, switch grass, and side oats grama. There are healthy populations of antelope, prairie chickens (greater & lesser), and a wide variety of other prairie wildlife species.

The overgrown farmland includes shrubs, weeds, and native prairie grasses. The stream has a balanced fish population. The timber, or woodland, is primarily made up of cottonwoods, green ash, elm, burr oak, willow, and eastern red cedar. A variety of wildlife species appropriate for the habitat types are found in the bottomland. Your first task is to map the area. (Your map should include a legend, compass directional markings, title, etc.) This can be done on back of this sheet or on a separate sheet of paper.



Survey of Animal Life:

Mammals

upland	1.	2.	3.
bottomland	1.	2.	3.

Reptiles/Amphibians

upland	1.	2.	3.
bottomland	1.	2.	3.

Insects/Invertebrates

upland	1.	2.	3.
bottomland	1.	2.	3.

Birds

upland	1.	2.	3.
bottomland	1.	2.	3.

Fish

upland	1.	2.	3.
bottomland	1.	2.	3.

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Flint Hills cont'

List the value of the land to:

PEOPLE		WILDLIFE		AGRICULTURE	
upland	bottomland	upland	bottomland	upland	bottomland
1.	1.	1.	1.	1.	1.
2.	2.	2.	2.	2.	2.

State what you think *valuable* and *suitable* mean. Do the words apply to people or do they include wildlife also?

Wildlife is (Check one:) ☐ very valuable ☐ moderately valuable ☐ not valuable

The land-use options you have established are:

No. 1 Nature Preserve/Wildlife Refuge

No. 2 Cropland/Grazing land

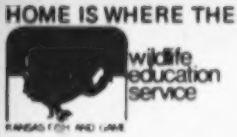
No. 3 Wildlife Management Area—public hunting, fishing and wildlife production

No.4 State prairie park

No. 5 Housing project

No. 6 Your idea

NAME _____



Flint Hills cont'

Complete the chart below to help make your decision.

LAND USE CHOICE (As listed on the bottom of the last page.)

	1	2	3	4	5	6
The variety of wildlife and native plant species would . . . increase (I) or decrease (D)? Why?						
List visible changes to the terrain of the land.						
Land is now more (M) or less (L) valuable for: wildlife people agriculture						

Your decision is to use the land for _____
because,

Can you determine ways to use several land use choices (ie, grassland for grazing and wildlife use)?

NAME _____

Adapted from an Illinois conservation education kit.

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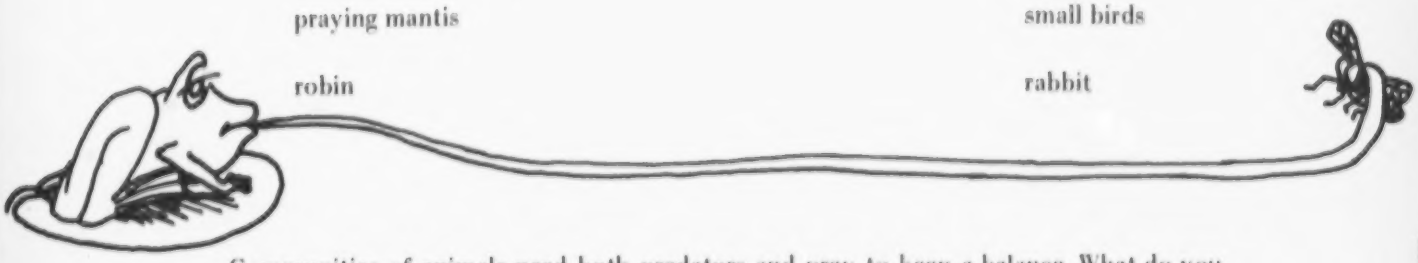
Predator-Prey

Animals that capture other animals for food are called **PREDATORS. PREY** animals are those eaten by predators.

Match the predator to its prey. Prey species can be used more than once. Predators may eat more than one kind of prey.

PREDATOR	PREY
coyote	fish
hawk	mouse
bald eagle	snake
raccoon	worm
owl	insects
bobcat	deer
mink	crayfish
praying mantis	small birds
robin	rabbit



Communities of animals need both predators and prey to keep a balance. What do you think would happen if we didn't have predators?

Predators have adaptations to help them capture prey. Think about the predators listed above and any other predators you know. Name at least 3 adaptations predators have.

NAME _____

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PROTECTIVE ADAPTATIONS

Animals are adapted to their habitats in special ways. They are able to protect or defend themselves from other animals. Some protective adaptations are listed below. Name at least three animals that have each adaptation. Choose one of the three animals for each adaptation and describe in detail, how it uses this adaptation. One has been done for you. Use your library for additional information.

PROTECTIVE ADAPTATIONS

mimicry
(look or sounds like another animal)

1. viceroy butterfly - monarch butterfly
2. king snake - coral snake
3. bluejay mimics hawk's cry

Monarch butterflies don't taste good. So, most birds will probably not try to eat a viceroy butterfly because it looks like a monarch.

antlers or horns
(put "a" behind those with antlers, "h" behind those with horns)

1.
2.
3.

jumps or runs

1.
2.
3.

hooves or claws

1.
2.
3.

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talons and beaks

1.

2.

3.

poisons or odors

1.

2.

3.

shells, scales or quills

1.

2.

3.

teeth, tusks or fangs

1.

2.

3.

stings or electric shocks

1.

2.

3.

NAME

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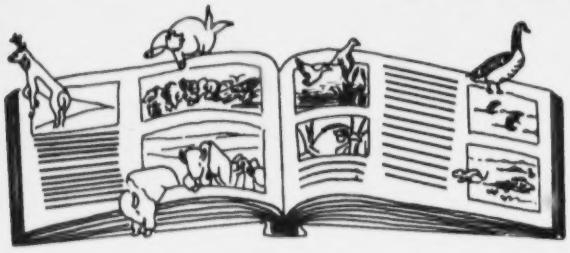
WILDLIFE IN BOOKS



Many books have been written about wildlife. Read a book about wildlife and answer the questions below.

Title of book

Author

Illustrator

Copyright date

Publisher

1. Is the story fiction or nonfiction?

2. Name the main characters. What species of animals are in the story?

3. If there are human characters in the story, name them. How do the people respond to the animals?

4. What is the setting of the story? When does it take place?

5. Does the story describe kinds of habitat? If so, which ones?

NAME _____

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6. The main character in a story is often the hero, or protagonist. Who is the protagonist in your story?

7. Some stories have an antagonist who works against the protagonist. If your story has one, who is it?

8. What is the main problem, or conflict, the characters meet?

9. How do the characters solve the problem?

10. What is the most exciting part, or climax, of the story?

11. **Anthropomorphic** means giving human characteristics to nonhuman things. Did the animals in your story behave like people or did they behave as animals do? Describe.

12. What is your opinion of the story? Tell why you liked or disliked it.

NAME _____

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Robin Reporting

Robins are frequent visitors in most Kansas neighborhoods and school yards during spring and summer. Imagine that you are a robin that recently returned from a winter in the south. Use the facts below to make your "robin report."

Your favorite foods are worms, insects, and berries.
You build a nest of grass and mud in trees, shrubs,or on buildings.
You are adapted to living near people.
You are active during the day (diurnal).
Your main predators are domestic cats and birds of prey. Cars are one of the leading causes of accidental death.
You live alone or with your mate during nesting season. You spend winter in flocks.

Describe the habitat you live in.

How are you adapted for food gathering?

How well will the habitat provide food during summer and winter? Explain.

How are you adapted for seasonal changes?

What evidence can you find of predators in your habitat?

How are you adapted to protect yourself from predators?

Are there other robins in the area?

If so, approximately how many? 30

NAME _____

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Where will you build your nest?

Draw a map of the area, including the location of your nest and other important features in the habitat. How much space do you need?

What is your opinion of people? **Anthropomorphic** means giving human characteristics to nonhuman things. People should not assume that wild animals feel human emotions.

How are you important to the community? (both human and wildlife communities)

NAME _____

HOME IS WHERE THE HABITAT IS

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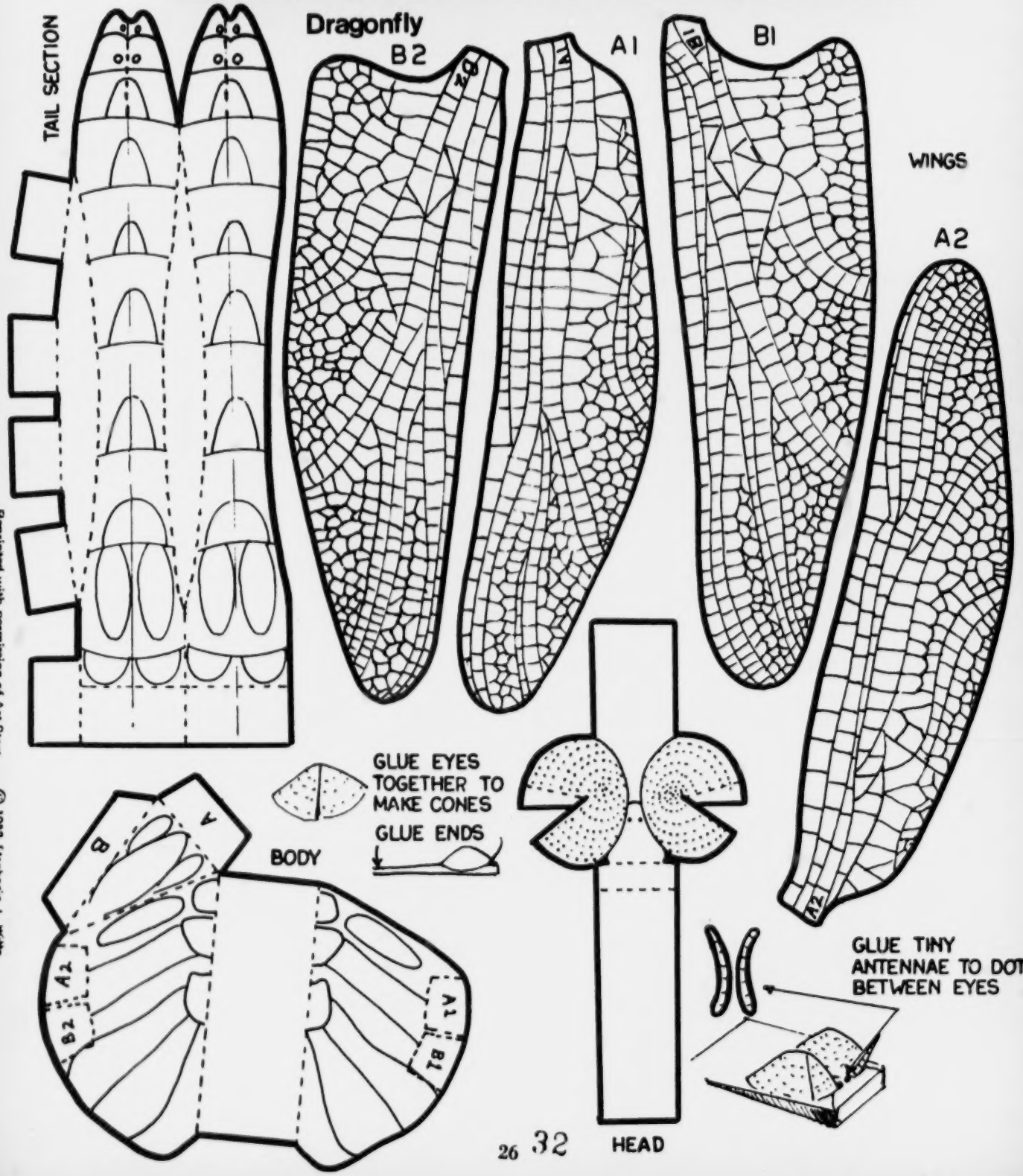
WILDLIFE IN ANOTHER DIMENSION



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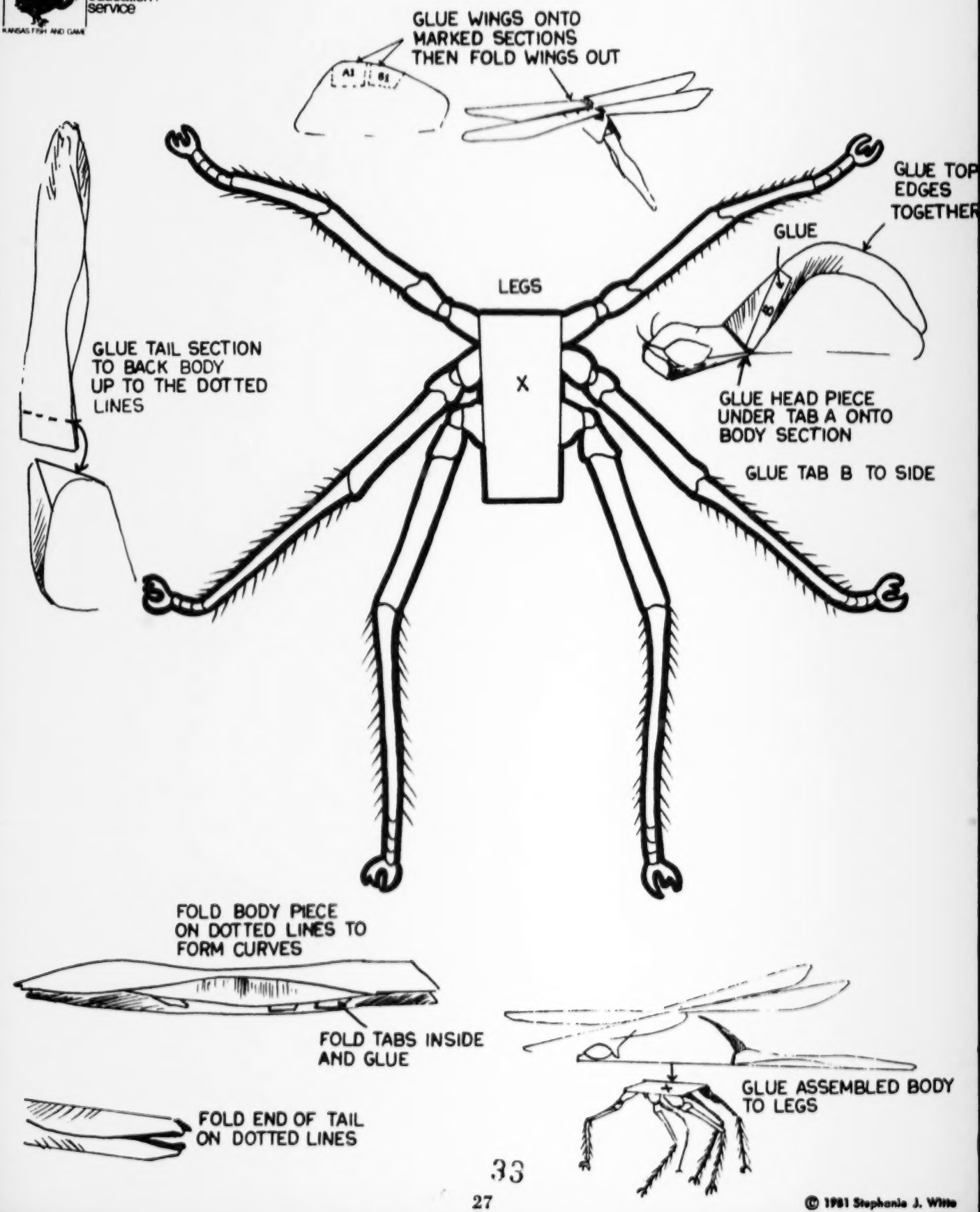
DIRECTIONS

Dragonfly cont.


GLUE WINGS ONTO MARKED SECTIONS THEN FOLD WINGS OUT
A1
B1
GLUE TOP EDGES TOGETHER
GLUE
LEGS
X
GLUE TAIL SECTION TO BACK BODY UP TO THE DOTTED LINES
GLUE HEAD PIECE UNDER TAB A ONTO BODY SECTION
GLUE TAB B TO SIDE
FOLD BODY PIECE ON DOTTED LINES TO FORM CURVES
FOLD TABS INSIDE AND GLUE
GLUE ASSEMBLED BODY TO LEGS
FOLD END OF TAIL ON DOTTED LINES

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HOME IS WHERE THE HABITAT IS

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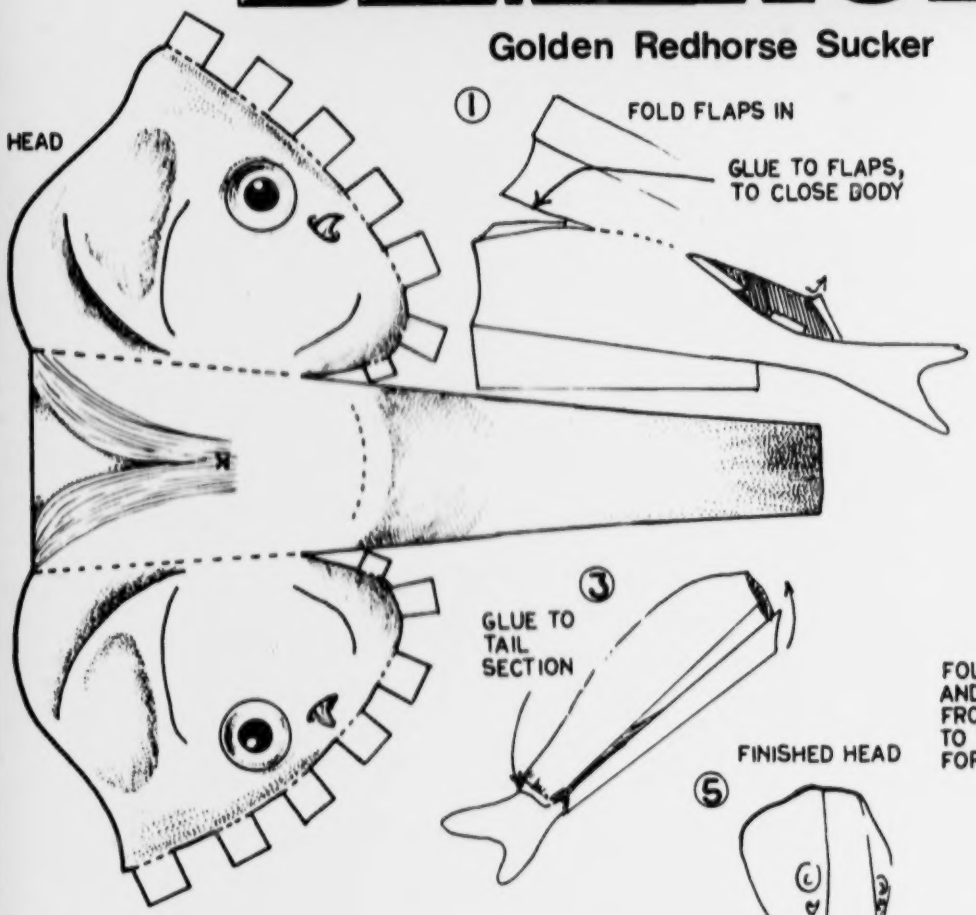
WILDLIFE IN ANOTHER DIMENSION

Golden Redhorse Sucker



① FOLD FLAPS IN

GLUE TO FLAPS, TO CLOSE BODY

② FOLD BOTTOM FLAPS ON DOTTED LINE

GLUE A OVER B

③ GLUE TO TAIL SECTION

④ FOLD TABS AND GLUE FRONT PIECE TO TABS TO FORM HEAD

FRONT PIECE

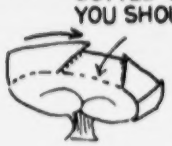
FINISHED HEAD

⑤

⑥

SLIDE HEAD OVER BODY SECTION UP TO THE DOTTED LINE UNDERNEATH BODY. GLUE HEAD TO BODY AT GILLS.

⑦ CUT SLITS IN THE MOUTH AND GLUE FLAPS OVER TO DOTTED LINE. FOLD CURVED DOTTED LINES CAREFULLY. YOU SHOULD DRAW OVER THE CURVES WITH A BLUNT PENCIL OR PEN TO MAKE THE CURVE FOLDING EASIER.



⑧ ATTACH THE MOUTH UNDER THE HEAD. THE TOP EDGE OF THE MOUTH TOUCHES THE DOTTED LINE.

GLUE THE STRIP TO THE X.

PUT A SMALL DOT OF GLUE ON THE SIDES OF THE MOUTH.

⑨ ATTACH ALL FINS BY MATCHING THE NUMBERS.

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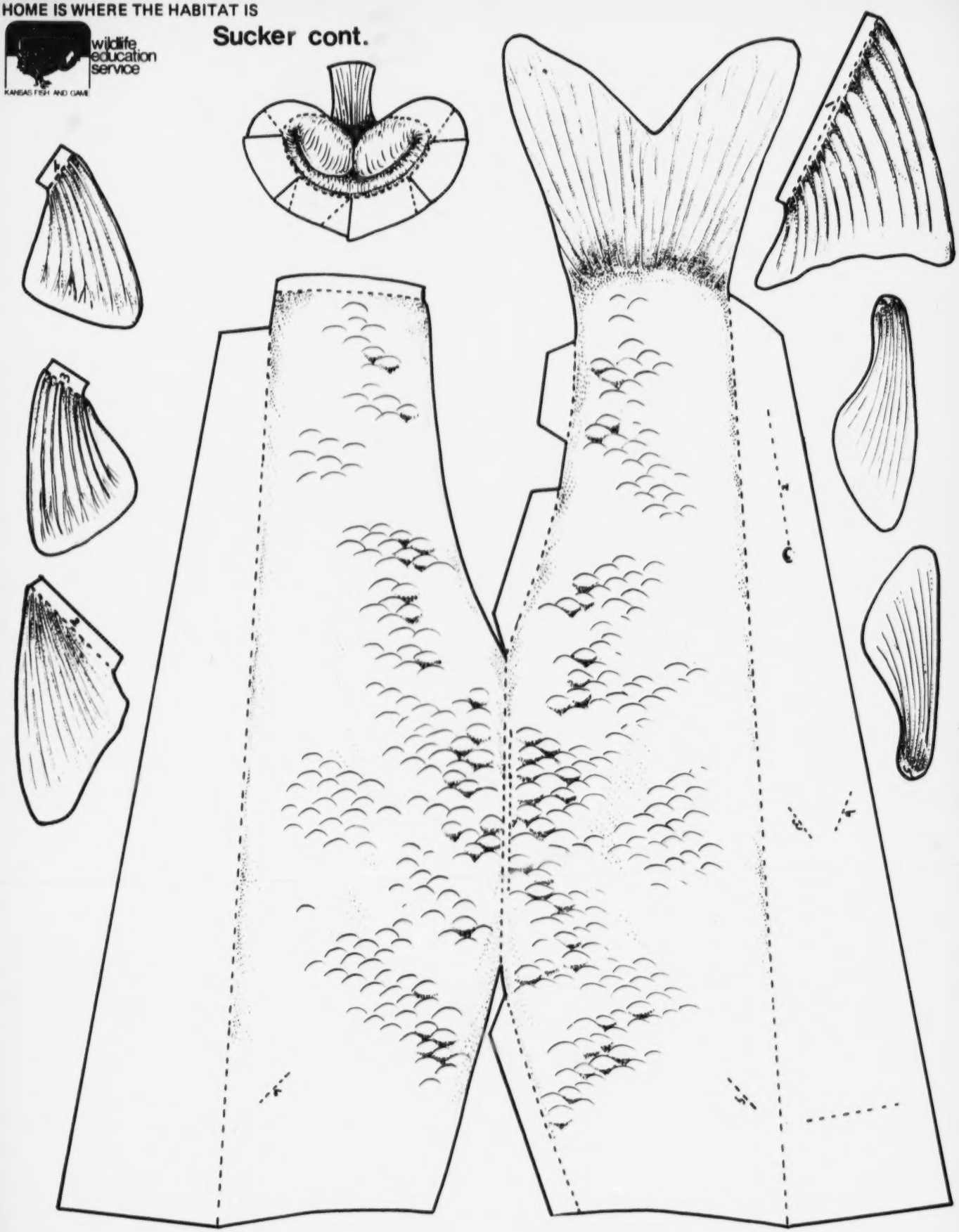
Sucker cont.



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CRITTER DICTIONARY REVIEW

Review the words you have seen or heard when talking about wildlife by matching the word to the correct definition. Use your dictionary to check your work. One has been done for you.

		Definitions:
habitat	SPECIES	1. a kind of animal having unique characteristics
classify	_____	2. mainly eats insects
predator	_____	3. animal with a backbone
prey	_____	4. hoofed animal
conservation	_____	5. the wise use of natural resources
ecology	_____	6. habitat along a stream or river
species	_____	7. active during the day
adaptation	_____	8. the study of the relationship between organisms and their environment
ungulate	_____	9. moves to different areas with changing seasons
migrate	_____	10. all wild, living creatures
vertebrate	_____	11. plant-eater
invertebrate	_____	12. animal without a backbone
warm-blooded	_____	13. spend the summer in a dormant state
cold-blooded	_____	14. eats seeds or grains
riparian	_____	15. fits into the environment
extinct	_____	16. to group with similar characteristics
endangered	_____	17. active at night
threatened	_____	18. meat-eater
hibernate	_____	19. body temperature adjusts to surroundings
estivate	_____	20. animal that kills for its food
diurnal	_____	21. environment animal lives in
wildlife	_____	22. species is in danger of becoming extinct – protected by law
nocturnal	_____	23. an animal or plant that lives on or in an organism to get food
herbivore	_____	24. species may become endangered – are watched carefully
carnivore	_____	25. eats both plants and animals
omnivore	_____	26. body temperature constant – make body heat by being active
granivore	_____	27. spend winter in a dormant state
parasite	_____	28. an animal hunted for food
insectivore	_____	29. species no longer exists

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NAME _____

Instructor's Note – The words on this page are primarily taken from the 4th-6th grade Wildlife Education Service packets. This may be used as a review quiz.

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Interspersed Vocabulary

Directions:

Many new vocabulary words were introduced in "Home Is Where the Habitat Is." See how well you do on this vocabulary review.

1. The number of animals that a particular habitat can support at a given time is called
   a) limiting factor
   b) arrangement
   c) carrying capacity
   d) distribution

2. The essential ingredients for a healthy habitat are
   a) water, food, predators, and prey
   b) food, water, cover, and space
   c) food, water, space, and wildlife
   d) natality, mortality, migration, and surplus

3. When food and shelter of habitats is combined it forms a/an
   a) edge
   b) shelterbelt
   c) arrangement
   d) overcrowding

4. The natural aging process habitat gradually undergoes is called
   a) extinction
   b) diversity
   c) mortality
   d) succession

5. The number of animals of a particular species in a certain habitat is called
   a) overcrowding
   b) population
   c) interspersion
   d) quantity

6. Trees and shrubs that are planted in an arrangement to protect from wind and weather form a
   a) shelterbelt
   b) fence row
   c) brush pile
   d) roadside ditch

7. The quantity of wildlife above the carrying capacity is called
   a) overcrowding
   b) interspersion
   c) surplus
   d) distribution

8. Animals that hunt other animals for food are called
   a) predators
   b) prey
   c) insects
   d) herbivores

9. The most common habitat in Kansas and the Great Plains is
   a) forest
   b) marsh
   c) prairie
   d) thicket

10. The process of adjusting to the changing environment is called
    a) migration
    b) interspersion
    c) distribution
    d) adaptation

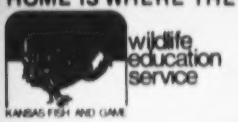
Bonus question:

Conservation means _____

and _____ (is/are) responsible for it.

NAME _____

Key: 1-c; 2-b; 3-a; 4-d; 5-b; 6-a; 7-c; 8-a; 9-c; 10-d. Bonus: wise use of natural resources; all of us.



Supplementary Activities and Approaches

Listed below are approaches for using the student booklet and worksheets. Additional activities have been included for those teachers who are interested in furthering their study of wildlife. These activities can be done in a variety of curricula areas and are listed by subject. Basic skills will be practiced while students learn more about wildlife. Many of these ideas may already be familiar; others are new. A few of the activities were adapted from *Multidisciplinary Wildlife Teaching Activities*, by William Hernbrode, and *Sharing Nature With Children*, by Joseph Cornell. Check the Wildlife Reference Center for further activity sources. There are several excellent activity guides listed under Miscellaneous Books.

Language Arts

—The story script may be taped so that the students may listen while they read.

—After reading the story, have your students make up their own stories or poems about the animals they have seen in the booklet. Students can act out their stories or draw pictures to express their ideas. Have the children think about what it would be like to live in a world without wildlife.

—The words in the script, and especially those listed on the vocabulary page, can be used on a spelling list. If you have an existing list, these could be added as bonus words. Or try scrambling the order of the letters of each word or putting the words into a word search.

—Have students compile a list of local, state and federal wildlife areas for each county in Kansas. Compare the results by region of the state, population density, and to your home county.

—Use the booklet as a supplementary reading text to study compound words, blends, vowels, syllabication, affixes, parts of speech, etc.

—Write a commercial for some aspect of wildlife conservation that the students feel needs to be "sold" to the public. Perform these for the rest of the class and/or another class.

—Hieroglyphics,or picture writing,allows a visual understanding that we miss with our verbal communication. Combine the advantages of both forms of writing by making pictures from words.

—Play a modified version of charades. Have children take turns being the "describer." This person makes descriptive statements about the animals they have in mind. The rest of the class tries to guess what animal the describer is referring to. The first student to guess the correct answer becomes the next describer.

—American folklore contains references to wildlife. Provide a variety of sources for student research.

—If you read daily to your class, why not include stories or poems about animals and the environment, especially those related to Kansas? Recommend your favorite selections to the school or public library for their future purchases. Refer students to books about wildlife when they need help in making a selection.

—Invite a representative from a conservation group to speak to your class. Local Audubon, Izaak Walton League, Sierra Club, etc., members may be available to make a short presentation to the class and be interviewed by the students. Students should be prepared before the speaker arrives, and spontaneous questions should be allowed after the interviews are complete.

—Exchange letters with pen pals from a class in another state or region of Kansas. Choose an area that has habitat different from your area. Student's letters should include descriptions of wildlife and habitats near their homes. What are the similarities and differences? Photographs, illustrations, or samples of appropriate items may enhance the exchange.

—Have students list what they think are the most important issues facing wildlife and the environment. Brainstorm solutions and necessary actions. Children should bring in magazine or newspaper clippings that relate to the list of topics. What legislation affects these problems? What can you do in your area to help?

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—Review basic reading skills using the following article and questions. Develop other questions to practice skills you are currently teaching.

KEY TO LIFE

While humans generally think of the great outdoors as a place to seek recreation and scenic beauty, those outdoor places mean much more than that to wildlife.

The white-tailed deer, for example, must live in the outdoors from the moment of birth until death, in all seasons and elements. It must sleep and play outdoors, find food and water, and have places for hiding and protection. And, it must find those things reasonably close to each other in order to remain in good health.

Although the kinds of vegetation differ somewhat for other wildlife creatures, the problems and requirements are the same.

It is easy to see that certain types of vegetation are far superior to others. Some provide food for dozens of different species plus providing some protection. Some plants are virtually useless, and still others may provide that one critical need for one or more species. Because of these considerations, the planting of "odd areas" as plots for wildlife, can be highly beneficial.

Where the cover is and its relationship with other vegetation is perhaps of major importance. A grouping of several types of vegetation in one area — food, roosting and loafing areas and travel lanes between them, fulfill the humble needs for all species.

Birds, such as pheasants, can travel farther because they fly. Earthbound species must walk, so distance is more of a factor — especially if the animal is required to cross roads or open areas. Man, vehicles, dogs and other hazards all take a toll during the year, so quality of habitat is critical.

Basically, habitat has four essentials — living space, food, water and cover.

—*Taken from "Wildlife Habitat Planning and Planting for the Future - Nebraskaland Magazine.*

Word Attack Skills — Use context clues to define the following words: recreation, scenic, vegetation, requirements, critical, "odd areas", plots, cover, roosting, earthbound, hazards, toll, and essentials. Circle all prefixes and box all suffixes. Write the base, or root word, to the side of the column. Select 10-15 multi-syllable words. Divide the words into syllables and place accent and pronunciation marks. Check your work with a dictionary. List all the words that have the same vowel sound as: bat, cow, near, fly and more.

Comprehension Skills — List the four components of habitat. How is vegetation important to animals? What can you do to help provide better wildlife habitat? Why is it important to have habitat components somewhat close together?

—Produce a mock court case of land use, i.e., "Wildlife Habitat vs. Agricultural Use." Have students list the needs of both sides, and see if they can come up with some compromises.

—Have students write a paragraph describing a particular Kansas wildlife species. They should include information such as its habitat preference and habits without naming the animal or describing it physically. Students exchange papers and attempt to identify a classmate's species by reading the description.

—Space exploration may lead to discoveries in wildlife we can only imagine. How would you describe Kansas wildlife to an explorer from another planet? Consider the differences in vocabulary and the difficulties in understanding your description. Use comparisons such as, insect antennae are like the antennae of your spaceship or this creature is about as long as a Martian is tall. Extra-terrestrial creatures may better understand adjectives and adverbs that can be acted out. Share your description with a classmate.

—Write haiku or cinquain poetry about the environment. Cinquains follow the following format: line 1-a 2 syllable title; line 2-a 4 syllable description of the title; line 3-6 syllables of action; line 4-8 syllables that describe a feeling; and line 5-a 2 syllable synonym for line 1.

—Have the students survey the schoolyard and group what they see as either "changing" or "unchanging". Explain why the changing items are experiencing this change. Emphasize that the environment is always undergoing change. Succession is the change in animal and plant species composition that occurs over time. What signs of succession can you see in or around the schoolyard? Estimate the age of each successional zone.

—Interview local senior citizens who grew up in your area, to get a perspective as to what the environment was like years ago. How have these changes affected wildlife and human populations? How have different types of habitat been affected?

—Write accurate plays or skits about wildlife in appropriate habitat settings.

—Have students draw from a stack of cards that have one of the following words written on them: prairie, woodland, marsh, lake, stream and reservoir. Next, they pick the native animal of their choice that is appropriate to that habitat. After researching this species, each student shares their information with the class.

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KANSAS FISH AND GAME

Science

—Make a calendar of wildlife events observed in your area, such as animal births, migrations, hibernations, etc. Compare this from one year to the next. Have the children keep a wildlife diary for a month when there is some observable activity in the area.

—Have a "touch and see" table in your classroom with tree bark, rocks, bones, shells, etc. that your students can explore in their free time. Add items that the children bring in. If you don't have room for a table, have a "touch and feel" box of appropriate size. Cut an opening for hand and arm, and place objects inside that students may identify by touch only.

—Water habitats are varied and extremely important. Gather a sample of water from a nearby stream, river, pond, reservoir, etc., and examine it under a microscope. What life can you see? What kind of animal community exists in this water? How does this community fit into the rest of the food web in this habitat? If there's no water available, substitute the creatures that survive on or near a tree or in plants on the schoolgrounds.

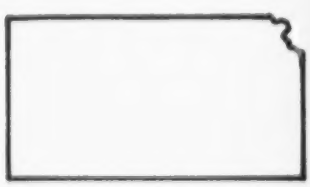
—Develop a habitat plot on your schoolgrounds. Prairie grasses and flowers can be obtained by gathering the seed heads at maturity. Trees, shrubs and other plants can be obtained from a local nursery; or they can be transplanted from another area in the fall or early spring. Use seed heads acquired from local farmers or seed stores to plant a food plot of sunflowers, milo, and millet for wildlife. Check with your local extension agent, soil conservationist, wildlife biologist or other conservation professionals for information and/or assistance. This ongoing project combines several disciplines in its scope and allows students pride in a project they can enjoy for years. One word of advice: Let your groundskeepers know of your plans, and fence off the area in some way to keep mowers from destroying your hard work. A sign explaining the project will let others in on what you're doing and could trigger further projects. How has your project changed the environmental quality of the area? Take an inventory of the wildlife in your study area. Do certain types of plants attract particular species? Develop a land use plan for your schoolgrounds and share it with the principal.

—Review animals in the booklet by fastening a picture of an animal on the back of one child. The other children can see the picture, but this child cannot. To discover his or her identity, the child must ask yes or no questions to the other members of the class.

—Habitat requirements vary in size for different species. Some animals can get by in a small space such as under a rock or log. Environmental factors, such as moisture, temperature, cover and light are different under an object. Have children place a piece of cardboard, scrap lumber or large rock on the schoolgrounds and periodically check what changes occur. Note when they first find animal life under the object. How are these animals adapted to life under this object? What do they eat? Are more animals found in sunny areas or shady ones? Do some species tolerate direct sunlight better than others? Keep a record of what is observed.

—Mark off a 40- to 50-foot trail, and place 10 to 15 man-made objects along it. The children walk silently along the trail, trying to spot (but not pick up) as many of the objects as they can. When they reach the end of the trail, they whisper the number of objects they saw to you. If they missed any, see if they can find them on a second try. End with a discussion of camouflage, and natural and man-made things. What examples of camouflage did they find?

—Divide the class into groups equaling the number of habitat types in Kansas. Each group is in charge of doing an indepth study on one particular habitat type. Groups may include: tall, mid and short grass prairie; riparian and woodland habitats; marsh; etc. Through maps, charts, graphs, photographs, and other audiovisual aids, each group will describe their community, including information such as location in the state, annual rainfall, altitude, range of annual temperatures, vegetation, geographic features, species of wildlife in the area, and human impact on the area. Each group will present their information to the class. How are the communities similar? How are they different? An alternative to this activity would be an indepth study of your county.



—Build a class terrarium so that children can observe animals such as snails, earthworms, beetles, etc. Children can observe the interaction of animals with plants. How are plants and animals alike, and how do they differ?

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—Play the food web game. Each participant wears the name of a plant, animal, or element (air, sun, water or soil). The name tags can be decorated with a picture of the plant, animal, or element. The name tags are made from 5 x 7 cards and can be easily worn if a piece of yarn is attached to the corners of the card so that it will hang around the neck. Use animals and plants found in your area; some suggestions are: fish, cricket, snake, mosquito, owl, bluejay, turtle, bobcat, mushroom, trees, poison ivy, dandelion, etc. Have the group form a circle, standing close enough together so they can read the other name tags. The person labeled "SUN" begins the game. He or she hangs onto the end of the yarn and passes the ball of yarn to any other player who has a direct need for the sun. The player who receives the ball of yarn looks for a player he or she needs in order to survive, or a player who depends on him or her for survival. He or she holds onto the strand of yarn and passes the ball to that next player. As the game progresses, discuss the relationships between the members of the web. Try to get all the players involved, and discuss why the elements and lower level organisms seem to have more yarn in their hands (therefore needing to have more organisms at that level than at the upper level). Before enthusiasm wanes, discuss what impact people have on the food web. How does draining a marsh or pond, fire, disease, and restoring habitats affect the food web. Of course, we have some positive and negative impacts. The group might consider what they can do to keep the food web in a healthy state.

—Take advantage of your schoolground and surrounding area. You don't have to travel far to study the environment. Weekly hikes around the schoolyard can be very enlightening, especially if you select a topic or theme that will hold students' attention. Topics might include: animal homes, animal tracks and traces, animal sounds, birds, mammals, insects and other invertebrates, life on tree bark or other plants, cold-blooded wildlife (fish, reptiles, amphibians), spiders and their kin, predator-prey relationships, and life under a board or rock. Let the children come up with an occasional theme.

—The impact of natural and unnatural events on a closed system such as our environment can be observed on a smaller scale in a terrarium or aquarium. Inexpensive ones can be made in a wide-mouthed jar. For a terrarium, put a layer of charcoal in the bottom of the jar followed by an inch or so of gravel, then soil. Place select small plants in the terrarium, water the soil and secure the lid on the terrarium. Place it in an area where it will receive diffused sunlight. For an aquarium, place a layer of material in the bottom of the jar, similar to the bottom of a pond that is in your area. Fill the jar with water from the pond. Before sealing the jar, examine some of the water and bottom material under a microscope to observe any living creatures. To note the impact of events on a closed system, open both jars and spray a mist of gasoline in the terrarium and fertilizer in the aquarium. Note the changes in the systems. How do these changes compare with what humans do to the environment? Discuss the increase in organisms that are results from the fertilizer. Run-off from fertilized fields lead to ponds and streams having too many nutrients and therefore too little oxygen to support the aquatic life. Reexamine the number of organisms in the aquarium after the addition of the fertilizer. What do the words eutrophication and stagnation mean?

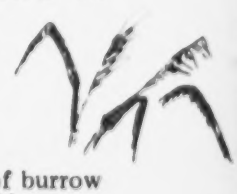
—Now that students have an idea of the species they'd find in a particular habitat, see if they can apply this information. Have them list a wide variety of Kansas species, then select their favorite. On a slip of paper, list habitat types. Each habitat type will need to be repeated enough times so that the number of slips equals the number of students. Each child randomly draws a habitat type. Have the children list their animal's adaptations and state why or why not it is adapted to the habitat they selected. If the habitat is not appropriate, where does the species belong?

Art

—See how alert your class is to detail with the following activity. Have children draw a sequence of drawings (or take photos) that represent a short hike that they took on the schoolgrounds. Another student can try to retrace the route by using the drawings.

—Draw scenes of each of the major habitat types in Kansas. Include appropriate vegetation, terrain, and wildlife. What would a cross-section of these areas look like? A cross-section of a pond would include land above water, water, and land below water. As a class, or in groups, make a model of the cross-section.

—Make a collection of some of the native vegetation found in the different habitat types in your area. Prairie grasses, leaves, and seed pods can be pressed, labeled, and displayed for others to learn from. Have the children use other samples of plants to make a collage. Xerox some of the feathery grasses, or draw an illustration by rubbing the natural colors of plants onto a piece of paper.

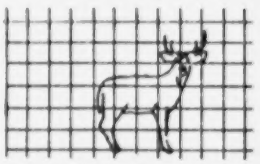


—Design homes for several species of wildlife. Research details of the home, such as size of burrow openings, size of nest, or shape of den. Each student or group can build a model of an animal home or their favorite animal out of paper maché. Discuss what the animal's needs are. Compare the model with a real animal home. How is the animal adapted for building its home?

wildlife education service

—Make a series of animal posters by habitat types. Divide the class into groups; each group is responsible for a particular habitat (i.e., prairie, woodland, rivers, etc.). On the back of the poster, students should include important information about the habitat and a short biography on each species represented.

—Allow children an opportunity to draw animals at a different scale. Trace the outline of one of the animals in the booklet onto grid paper. Give each child a copy of this illustration, and provide them with a sheet of grid paper of a larger or smaller scale. Their job is to reproduce the illustration at the different scale. Have them figure how many times larger or smaller their drawing is than the original.



—The worksheets include three-dimensional models. Run off copies of these pages on construction paper to add support to the model. See if you or your students can design other animals by using these as patterns. You may want help from volunteers when children are working on these projects.

—While hiking through different habitats, collect natural objects such as seeds, pine cones, dead twigs, dried mushrooms, etc., to make a nature picture or class collage. Items can be glued to cardboard, and may be separated by habitat to form a three-dimensional habitat artifact collection.

—Puppet plays allow students to creatively express their knowledge of a subject or several concepts. Have the children create puppets and put on plays for other students. The play topics might include: how wildlife would deal with a particular problem facing them, succession, animals finding a place to live, predator-prey relationships, food chains, etc. Appropriate background music can be played to add to the presentation.

—Make wildlife sculptures from tumbleweeds, sand, or snow. Paint the finished sculpture with dilute tempera in a spray bottle or with spray paint. Details can be added with a paintbrush or additional materials, such as fabrics.

—Design wildlife bookmarks, book jackets or bumper stickers. Cover the surface with clear contact paper for durability.

—Make plaster casts of animal tracks. Begin by locating mammal or bird tracks. Make a collar from construction paper to surround the track so that the plaster is held in place. Combine plaster with water until a pancake batter consistency is reached. Place the collar around the track. Pour the plaster into the collar and wait 15 to 25 minutes for it to dry. A paper clip can be inserted in the plaster cast before it's completely dry, so that the finished cast can be hung on a wall. Identify the track with field guides. What can you tell about an animal from its track? A less messy alternative to plaster casts is recording tracks on smoked paper. Smoked paper can be made by holding paper over a burning candle, allowing carbon from the smoke to collect on the paper. Anything that touches the surface will leave a mark. Place the sheets in areas where animals are known to travel, or use bait to draw animals to the paper.

—Take photographs of wildlife in a variety of situations. If possible, develop your own black and white photographs. Explain the process of developing negative and positive images.

—Wild animals display not only a variety of colors and shapes, but also different patterns. Notice the interesting patterns in butterflies, fish scales, spider webs, feathers, etc. Combine these designs in a drawing or a painting.

Industrial Arts

—Bluebird nesting boxes should be erected in reasonably open areas since the birds will not nest in the woods and rarely in the deep shade. The best location is an open area with scattered trees, a considerable distance from buildings, where the ground is not covered with underbrush, tall grass or weeds. Pastures, fields, large lawns, cemeteries, and golf courses are usually good locations. Ideally, the bluebird nesting box should face an open area, with a tree, large shrub, or fence from 25 to 100 feet in front of the box. The young birds will usually reach this on their first flight and have a better chance of surviving the first critical hours out of the nest. Bluebirds usually will not nest closer together than about 100 yards. By using the small holes shown in the top and bottom extensions of the backboard, the box may be nailed or screwed to the top or side of a wooden post or it may be bolted or wired to the top or side of a metal post. A smooth metal post such as a galvanized pipe is preferred to a wooden post, because it offers better protection against climbing predators, particularly if the post is coated with soft grease while the bluebirds are occupying the box. A one-half or three-quarter-inch galvanized pipe, threaded at one end, can be neatly and firmly attached to the bottom of the box by means of a pipe flange, which may be obtained at any hardware store. A bluebird nesting box on a wooden post may be protected from predators by means of a sheet metal collar or conical guard, 18 or more inches

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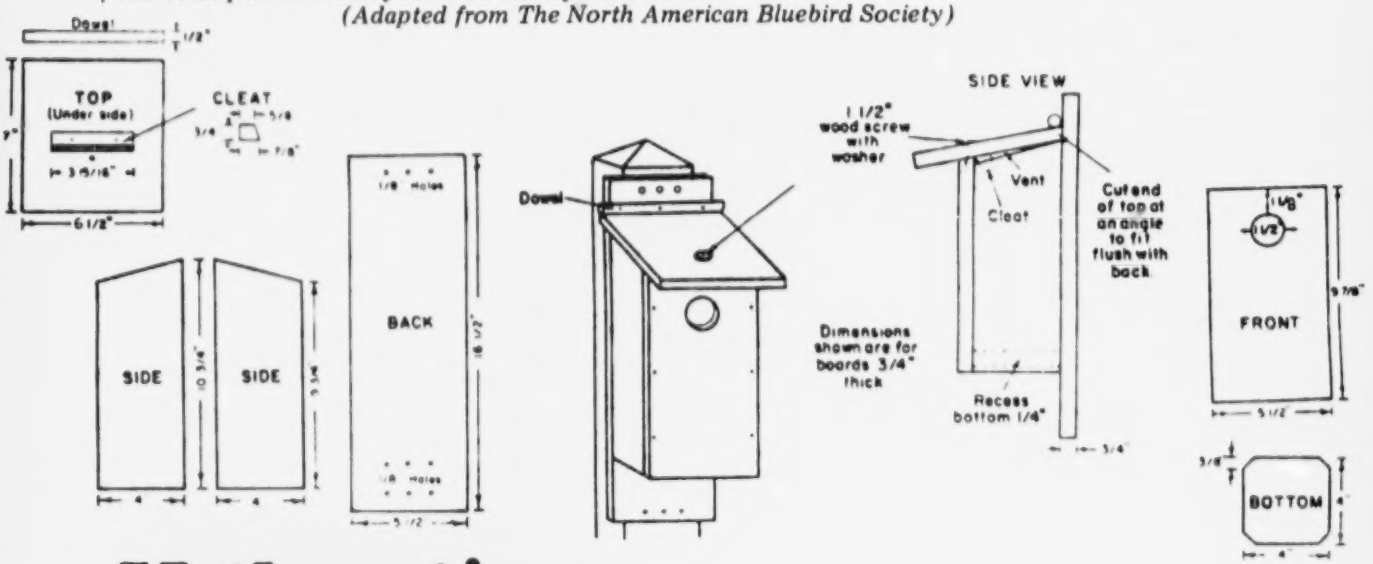
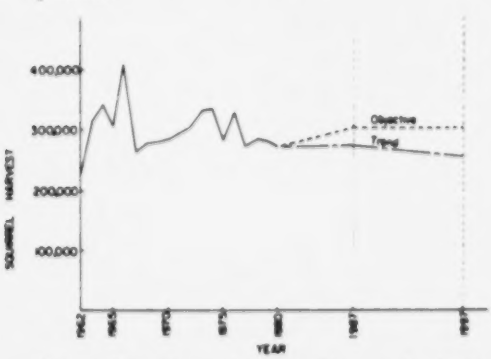
wide, attached just below the box. Where predators are not a problem, nesting boxes may be mounted conveniently on posts of existing fences, or on the trunks of isolated trees (never among the branches). If posts of pasture fences are used, the boxes should be on the side away from the animals. Bluebird nesting boxes should be mounted at a height of from three to five feet, higher where there is danger of vandalism. They should be set out by late winter. Bluebird nests should be removed from the boxes as soon as the young have left, as this will increase the chances of second or third broods being raised in the same boxes. The boxes should be inspected, cleaned, and repaired each year in late winter, making sure that the drain holes in the floors are open. Plans and instructions for other types of bird boxes can be acquired. Check your local library for details.

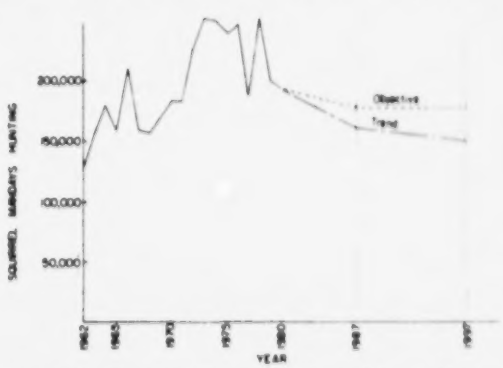
(Adapted from The North American Bluebird Society)



Mathematics

—There are three species of tree squirrels in Kansas: Gray squirrels, fox squirrels, and southern flying squirrels, with only gray and fox squirrels being hunted. Flying squirrels are restricted to eastern Kansas. Fox squirrels are found throughout the state in suitable habitat, while grays occupy heavily timbered areas in the eastern quarter of Kansas. The current supply of squirrels exceeds hunting demand. The tree squirrel population is estimated at 1.4-2.0 million. The average annual harvest from 1962 to 1980 was 303,000 with an average daily bag (harvest) of 1.7 squirrels. Squirrels are pursued by approximately 21.9 percent of small game hunters. Non-consumptive use of the resource is believed to be significant due to the visibility of squirrels — particularly fox squirrels in urban settings. Two major problems facing squirrel management are (1) There is a general decline in habitat. (2) The recreational use of tree squirrels is not fully known nor is the value of the resource realized and utilized by the public.





From the above information, ask students to solve these and other mathematical problems that you may pose to them. (1) What year showed the highest squirrel harvest? The lowest?

(2) What is the trend of the squirrel population? Why?

(3) Approximately how many squirrels were harvested in 1975 and how many days did hunters spend hunting squirrels that year? What would the harvest of squirrels per day be for 1975?

(4) The trend falls short of the objective for 1987 in both graphs. How much difference is there between trend and objective for both graphs? What strategies would you use to meet the objectives?

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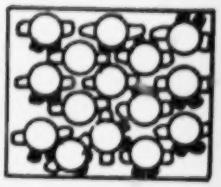
KANSAS FISH AND GAME



—Demonstrate the effects of crowding with the following activity: Place an old blanket, sheet or tarp outside or on the floor. Measure the area. Ask the entire class to stand somewhere on the blanket. The children get off and you fold the blanket in half. Measure the new area, and have the children get back on the blanket. They may have to work at getting in the space. Have them get off, and once again, fold the blanket in half. Measure the new area. Have the students attempt to fit. They should use their imaginations to get most of the children on. Continue the procedure until only one person fits. Have the children compare this situation with that of wildlife and habitat loss. Wildlife and people need space.

—Species diversity is one measure of the stability of a community. The greater the diversity, the more stable the community. Measure the species diversity on several sites of the schoolground by using the following formula.

$$\text{Diversity} = \frac{\text{Total number of species}}{\sqrt{\text{Total number of individuals}}}$$

Have the students work in small groups, applying this formula to a square meter plot. What factors are involved in the differences in diversity throughout the schoolground? Where is the species diversity the highest? How does plant diversity affect animal diversity? How does this number vary throughout the seasons?

—Size can be an abstract concept unless it is visually displayed. Students can grasp the size of many units of measurement, such as an acre or the size of animals, if they are marked off on the school grounds. For animal measurements, use a field guide or other resources to get accurate height, length, and weight measurements. How tall is an antelope? How long is an average adult rattlesnake?

—Estimates of populations can be figured using a technique called the Lincoln-Petersen Index that will allow students to work with ratios. This technique can be practiced using beans or some type of playing chip, and later expanded to real wildlife populations. Mark off a one or two square meter plot for each small group of students. Deposit an unknown quantity of beans in the plot. Give the students 30 seconds to "capture" all the beans they can find. Count the beans and mark those beans with a magic marker. Throw the "captured" beans back in the plot. Once again, allow the students to capture individuals and count the captured. How many of these individuals were marked from the first capture? Figure the Lincoln-Petersen Index using one of the following formulas:

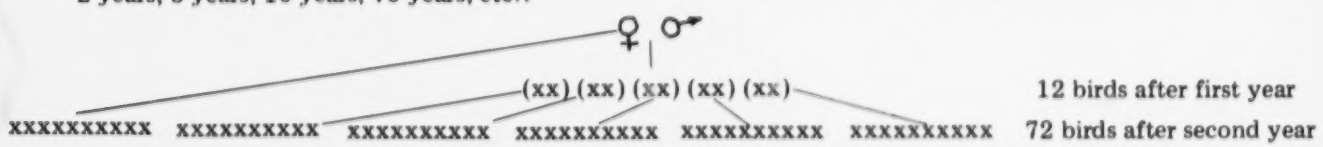
$$\frac{\text{Population Estimate}}{\text{Total Number of Individuals Captured the First Time}} = \frac{\text{Total Number of Individuals Captured the Second Time}}{\text{Number of Marked Recaptured Individuals}}$$

or

$$\text{Population} = \frac{(\text{Number caught first time}) \times (\text{Number caught second time})}{\text{Number of Marked Recaptured Individuals}}$$

What problems might arise when biologists use this technique?

—Populations grow exponentially. This concept can be demonstrated by using the example of a pair of pheasants. This pair produces a brood of 10 offspring each year. Assume no mortality and an even sex ratio. The 6 pairs will each produce 10 offspring the next year. How many young will be produced in 2 years, 5 years, 10 years, 70 years, etc.?


♀ ♂
(xx) (xx) (xx) (xx) (xx)
12 birds after first year
xxxxxxxxxx xxxxxxxxxx xxxxxxxxxx xxxxxxxxxx xxxxxxxxxx xxxxxxxxxx
72 birds after second year

Most wild animals do not die of old age. Mortality is due to predation, disease, habitat loss, hunting, and other factors. In the wild, natural mortality rates would reduce a population of 10 pheasants to only 2 who would live to rear young. What percentage of mortality is that in a brood of 10? How does the growth rate of pheasants compare with that of humans? Gather data on the growth rate of the world, United States, Kansas, and your community since 1900. Extrapolate what the figures will be in the years 1990, 2000, and 2500. People have used technology to postpone the impact of humans exceeding the carrying capacity of the earth. If we continue to grow at a fast rate, what do you predict will happen? Where is the growth rate the highest in the world? Graph the data you discover on human growth rate.

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Social Studies

—Wildlife is a renewable resource, as are many other components of the environment, such as trees. Certain numbers of wild animals and trees can be removed each year, because they will be replaced in the future. Humans tend to use resources without really thinking about the impact on the environment. Make a list of those things that you use daily, such as pencils, food, paper, etc. Trace the processing path to the original source of each item. Which ones are from renewable resources, and which are from nonrenewable resources? What ideas do you have to better conserve all of our resources? What is a good definition for "conservation"? Have each child write their own motto to live by, for environmental ethics. Our actions have an impact on the environment. We can determine to what extent the impact is positive or negative.

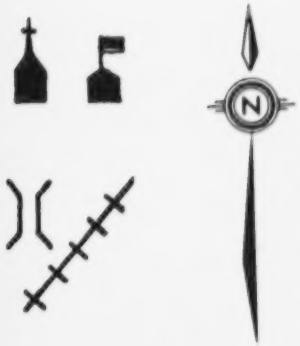
—Learn more about the seasons by keeping a record of changes throughout the year. Have the class pick a special spot on the schoolgrounds, or allow each child his or her own location for making observations. Observe the changes that take place through the year. How do shadows change with the time of day and season?

—Study the laws protecting wildlife in Kansas and the United States after discussing as a class what students think the laws are. Copies of regulations for hunting, fishing, and trapping can be obtained from any Fish & Game office and several sporting goods stores. Have students investigate who is responsible for administering and enforcing wildlife laws, penalties for violation of these laws, how laws and regulations differ, and how the United States compares to other nations in terms of law enforcement.

—Ask the children to observe and list habitat changes caused by humans. Discuss their lists, and ask how they think each of the changes has affected wildlife. If they had control over the past, how would they have acted differently? If they could control the future, how would they plan to manage for people and wildlife to share the world?

—People use natural resources at a fast rate. Recommend to your students that they recycle and conserve natural resources as much as possible. Organize a paper or aluminum recycling project for your school or district.

—Have the students plan and carry out a survey dealing with environmental problems. They should survey an equal number of adults as they do children. Their questions could include any of the following, along with questions they feel are important.
(1) Would you be willing to pay a "nonconsumptive" user fee for such activities as bird watching, photographing, etc., on state or federal lands? (2) Would you sort your garbage and recycle those portions that are readily recyclable? (3) What would you like to see done with our national wilderness areas? (4) Would you be willing to lower your standard of living so that the future might be a little brighter for wildlife and the environment? (5) What value do you place on wild animals? (6) What value do you place on threatened and endangered animals? (7) Would you ever knowingly break a fish and game law? (8) Would you save some habitat for wildlife even if it meant an expense to you?
Compare answers and determine what percentage of adults and children voted yes or no for each yes or no question. Tabulate your results and share them with your school and/or local paper.



—Planning is an important part of wildlife conservation. Cities can be preplanned to allow for a healthy mixture of homes, industry, parks, shopping centers, etc. Working in small groups, have the class design their idea of the ideal city. The city should include those components that are typical to a city, with the students highlighting those they feel are essential. Have them take into consideration the arrangement of the components so that the city is efficient, and environmental problems are at a minimum. They may need to discuss the arrangement, and draw several rough drafts before committing their final plan on a large sheet of paper. Standard map symbols should be used to designate churches, schools, bridges, etc.; along with a compass rose, legend, title, etc. Each group should share their plans with the class and compare the ideas of each plan. How do these plans compare with the community you live in? What environmental problems is your community facing and how could planning have helped prevent them? What changes would you make in your community to improve it? Have each child write their own definition of "land-use planning" before and after this activity. Compare the definitions and discuss the students' ideas. Apply what has been learned to develop a land-use plan for the schoolgrounds.

—Find examples of living things that depend on each other for their well-being or survival. Define and discuss the words mutualism, commensalism, parasitism, and symbiosis.

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KANSAS FISH AND GAME

—There are a variety of people involved in wildlife conservation careers. Their jobs may be fisheries and wildlife technicians, biologists, wildlife managers, law enforcement officers, research biologists, information and education staff, and administrators. What do these people do, and what kind of training is required for their jobs? Invite local conservation professionals to your class for a visit.

—Make a map of habitat located on the schoolground or in a nearby park. Label areas that receive the most sunlight. Place pictures of animals that are found in each area on the map. Add illustrations of signs that animals are in the area, such as insect chewed leaves, an animal home, or signs of animals in or around the bark of trees, etc. The map should also include a legend, compass rose, title, scale, and other features which make it complete.

—Some species of wildlife have adapted to life in urban areas. Have your students observe which species they find in urban settings and state how the species are adapted to this habitat. Do humans provide any of the animal's habitat needs (food, water, shelter, air, living space)? Some species of wildlife have adapted to urban life so well that we consider them pests. List some of these animals. Investigate techniques used to reduce problems that might occur from pest wildlife.

—The Kansas Fish and Game Commission is in charge of managing and conserving wildlife in the state. Regulations are set to control the harvest of wildlife. Laws are enforced by law enforcement officers, but it has not always been this way. Have students research the history of wildlife management in the United States: why it began, when and who were the leaders in the field? Suggest that they find out more about President Theodore Roosevelt's, Aldo Leopold's, and Durward Allen's impacts on wildlife conservation and legislation. Where are funds acquired to run wildlife conservation programs?

—Divide the class into four habitat groups: prairie; woodland; marsh; aquatic. Each group makes a report of the kinds of animals found in the habitat. The report should also include a map of Kansas showing where the habitats are found, and list some of the common vegetation for the area. Reports are presented orally to the rest of the class.

—People who enjoy wildlife are often lumped into one of two major groups: consumers or nonconsumers. Consumers include hunters, fishermen, or trappers. Nonconsumers are more diverse, including photographers, bird watchers, poets, artists, etc. Both groups have an impact on our wildlife resources. Both groups spend money when pursuing their interests. Divide the class in two parts to research how much money is spent by each group. Use information from the telephone book's yellow pages under sporting goods stores, motels, meat processing plants, photography shops, bookstores, service stations, etc., to survey what portion of their business depends on consumers or nonconsumers of wildlife. Which group spends the most? How much of this money goes toward wildlife projects? What value does wildlife have to the students? Can anyone truly be a "nonconsumer"? All activities have an impact. Some are positive and others negative. When we build roads, houses, farms, etc., we are consuming wildlife by destroying habitat. We do have input on our own actions and their impact. An excise tax is placed on some sporting goods equipment. What are Dingell-Johnson and Pittman-Robertson funds and how are they spent; If a "nonconsumer" license was available and/or required, what do you think the public's response would be?

—Have students list the habitats they live in, such as home, school, etc. What is their favorite habitat? Their least favorite? Which habitat do they spend the most time in?

Music

—Write new wildlife-related lyrics to old songs.

—There are many songs dealing with the environment or specific animals, such as "The Ants Go Marching." Find some other songs that deal with wildlife, or put a poem to music. Contact the Missouri Department of Conservation, P.O. Box 180, Jefferson City, Missouri 65102, for their song book, Missouri Conservation Melodies. There is a charge for this valuable book and accompanying cassette tapes.

—Which animals would make good sopranos, altos, tenors, or basses? Listen to tapes, records, or the animals themselves while on a walk.

—Some animals make specific calls, warning signals, or songs. Design instruments that sound like animals. Use wood, sandpaper, glue, construction paper, and odds and ends to create the sound.

—Have the children listen to bird or other animal sounds. Then have them design an animal they think would make that sound, and compare the real animal with the imaginary one.

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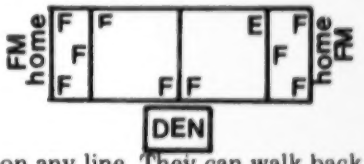
—Some birds, such as the mockingbird, can imitate other birds. How well can you "mock" bird songs? Put words to the beat of the bird songs and calls. Can you tell by listening to the sounds if the birds are using their voices to establish territories, attract a mate, or sound danger?

Physical Education

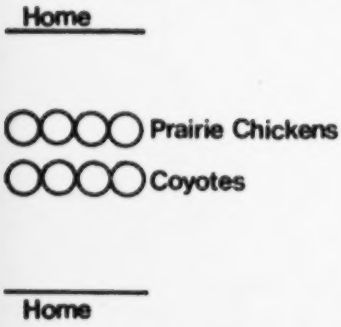
—There are dances named after animals, such as the bunny hop and the fox trot. Try creating your own animal dances. Begin by demonstrating and practicing the bunny hop and fox trot. Give each group of 5 children an animal dance name, such as Buffalo Bump, Squirrel Swing Step, Rattlesnake Rumba, Porcupine Polka, Turkey Two-Step, Catfish Crawl, or Turtle Tango. Each group performs its dance in front of the class using the music of its choice. Stress that students use creativity in developing their dance.

—Play "Producers-Consumers". Two people are the "sun". The remaining students are "producers" or "consumers" (about 1 consumer to every 2 producers). The sun players have a handful of marbles (energy). They are attempting to reach the producers, and give them a marble, without being tagged by a consumer. If tagged, they have to give up one marble to the consumer and continue on their way. The producers are also trying to avoid being tagged by a consumer. If tagged, the producer stands still. At the end of play see how many marbles the producers and consumers have. Discuss what happens when there are more consumers than producers.



—Play "Fox and Field Mice". Ten children become foxes; others are field mice. They stand in the boundaries as shown in the diagram. Foxes may run from side to side but not out of their boundary line. The field mice line up at the starting line and try to make it to the finish line without being tagged by a fox. As many as four field mice may run at one time. Field mice are safe at home or while standing on any line. They can walk back and forth on the line, waiting to escape. If caught, the field mice sit in the den. Start a new game when several field mice have made it safely home, or when several are captured in the den. Have the field mice and foxes reverse roles.

—Have each student select the name of a favorite Kansas animal. A name can be used by more than one student. The players line up at one end of the playing area. One child is the chaser and calls out the names of Kansas animals. When a player's name is called, he/she must run to the other end of the playing area, trying not to get caught by the chaser. If caught, the player becomes an additional chaser. When all names have been called, the chasers call the names of those players who weren't caught. Play continues until all players are caught.

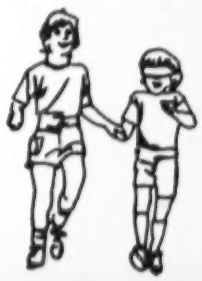


—Review what you've learned about wildlife and get some exercise by playing "Prairie Chickens and Coyotes." Divide the class into two equal teams. One group is The Prairie Chickens; the other is The Coyotes. The teams line up facing each other about 3 feet apart. Home territory is marked with a line 15 feet behind each team. The group leader or teacher makes a statement such as, "Wildlife needs water, food and cover to live." If the statement is true, the Coyotes chase the Prairie Chickens, trying to catch them before they reach their home territory. If the statement is false, the Prairie Chickens chase the Coyotes. Any players who get caught become members of the other team. Some questions might cause confusion. The leader should stay quiet until after the commotion has ended and then discuss the answer with the group. Sample questions might include: "Reservoirs are built to hold water." (T)

—When students are running or playing on the playground, have them pick up litter. Their ticket to get back inside is at least six pieces of litter.

—Divide the class into groups of approximately 5. Each group is given the name of an animal or chooses their own. The group combines to form the animal. The rest of the class tries to guess what animal the group is portraying.

—Take a "blind trust" walk. Students work with partners, each having a chance to be blindfolded. While "blind" they are carefully led to explore surrounding areas using their other senses. The leader may have the blindfolded person experience touching a feather or tree bark, smelling the soil, listening to the wind, etc. A group can be led together by having participants hang onto a rope throughout the course. Conclude the activity by seeing if the participants can retrace their steps when the blindfolds are removed.



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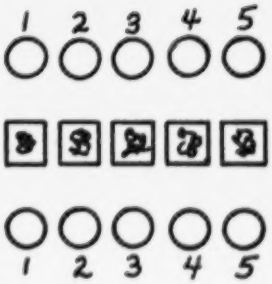


—The class forms two teams, and each team counts off. The teams face each other from either side of the play area, with pictures of animals mentioned in this unit on a center line. The instructor says the name of one of the animals, then calls a number. The two children with that number run to the correct picture, try to get it, and return to their place in line. The picture is replaced and play continues. The instructor keeps score. Add a challenge by having the player who does not reach the picture first attempt to tag the other player before he or she returns to home base. If the player is not tagged, the team gains two points; if tagged, one point.

—There is a variety of predator/prey games. Select one or more of the following to involve students in experiencing the concept.

(1) The player(s) who are predators are blindfolded. The other players are scattered throughout the area. One predator for approximately 12 prey. Each prey player is given a noise maker of some sort. It may be a horn, wooden blocks, bell, cymbal, etc. There is at least one other prey who also has the same noise maker. The prey attempt to find the players of their species while avoiding the predator's attempts to catch them. Any prey who are caught become predators.

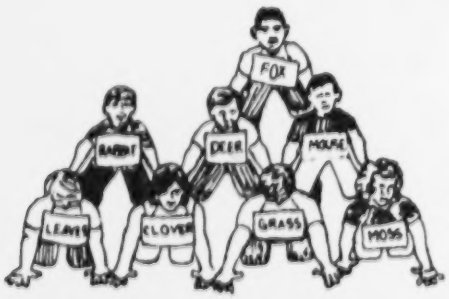
(2) Prey species are situated in an area and must remain there during play. The predator is blindfolded and spun around before attempting to find his/her prey.

(3) List predator/prey combinations that are appropriate for Kansas. Pairs of students represent each combination. The prey species is blindfolded away from the predator. The predators try to touch their prey without being noticed. If the prey senses the predator, they indicate that. If correct, they are not "eaten." Have students change the rules.

(4)Use bean seeds, popcorn, sunflower seeds or M&M's as markers. Give each child 10 markers to represent ten individuals of a species. Stress that an individual does not make a population, so that children will not be overprotective of each individual. Their desk top can only handle 8 beans living there (carrying capacity). They need to harvest enough of the prey to keep a healthy population. Every marker on the desk over 8 represents individuals that are dead from starvation or disease due to overcrowding. Each pair will produce one offspring per game. Add the correct number of markers. Run through the birth and death cycles a few times so that the children will become familiar with the factors facing predators and prey.

Whichever variation you select, stress to the class the concept that both predators and prey species play an important role in the environment. One cannot survive without the other. Animal populations often fluctuate in cycles, with a large number of prey and low number of predators. The predators will increase in number, reducing the prey without eliminating them. With a lower number of prey, the predators will be reduced. A natural system of checks and balances keeps the system working smoothly until humans interject artificial factors.

—This activity should be done outdoors or in a large, open space. Have each child secretly write the name of a plant or animal that lives in the area. The players are going to build a pyramid; but don't tell them that until you've collected the papers. Get the class thinking about food pyramids by asking questions such as, "What form of life is the first to use the sun's energy?" (Answer: Plants.) The fun begins when you start to build the pyramid and the plants realize their fate. The plants will be on the bottom of the pyramid because all animals depend on them directly or indirectly for food. The plants kneel down on all fours, close together in a line. All the plant-eaters (herbivores) stand in a line behind the plants. All the meat-eaters (carnivores) stand in a line behind the herbivores. There will nearly always be more children in the upper level groups than in the supporting plant groups. (It seems much more fun to be a bobcat or coyote than it is to be a dandelion or muskrat.) With so many on top and so few for a base, it will be very difficult to build a stable pyramid. Some of the predators will have to change their position. Challenge the children to reconstruct a pyramid that will support all its members. The larger children can become plants, and any omnivores (animals that eat both plants and animals) can be herbivores. The higher up on the food chain, the fewer the number of animals there are. Demonstrate the importance of plants by threatening to pull one of them out of the pyramid.



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KANSAS FISH AND GAME

Resources and References

etc... ...Appendix

Locate the Fish and Game Commission office closest to you. The office personnel may be of help, and most offices have free informational brochures.

Pratt Headquarters
Kansas Fish & Game Commission
RR 2, Box 54A
Pratt, Kansas 67124
316/672-5911

NC Regional Fish & Game Office
511 Cedar, Box 489
Concordia, Kansas 66901
913/243-3857

Downs District Office
Highway 24E
Downs, Kansas 67437
913/454-6315

Ellsworth District Office
North Main & West Douglas
Ellsworth, Kansas 67439
913/472-4290

Wakefield District Office
Wakefield, Kansas 67487
913/461-5402

NE Regional Fish & Game Office
3300 SW 29th
Topeka, Kansas 66614
913/273-6740

Blue Rapids District Office
801 S. Main
Blue Rapids, Kansas 66411
913/226-7509

Kansas City District Office
Clover Leaf Bldg. 1, Suite 221
6811 W. 63
Shawnee Mission, Kansas 66202-6024
913/722-6024

Lawrence District Office
512 E. 9th
Lawrence, Kansas 66044
913/842-5784

Manhattan District Office
Rt. 6
Manhattan, Kansas 66502
913/539-9479

Osage District Office
Osage State Fishing Lake
Box 303
Carbondale, Kansas 66414
913/665-7341

Valley Falls District Office
415 Broadway, Box 88
Valley Falls, Kansas 66088
913/945-3373

NW Regional Fish & Game Office
Route 2
Hays, Kansas 67601
913/628-8614

Colby District Office
190 Franklin, Box 366
Colby, Kansas 67701
913/462-3367

Stockton District Office
Division of Water Resources Building
425 Main
Stockton, Kansas 67669
913/425-6212

SC Regional Fish & Game Office
204 W. 6th, Box 764
Newton, Kansas 67114
316/283-2482
(Office will move to Valley Center on east K-164 after July 1985)

El Dorado District Office
2435 W. Central
El Dorado, Kansas 67042
316/321-6750

Emporia Wildlife Investigation Office
832 E. 6th
Emporia, Kansas 66801
316/342-0658
(Office will move to ESU campus after 6/85.)

Eureka District Office
300 W. Second
Eureka, Kansas 67045
316/583-6092

Wichita Urban-Metro Office
27th and Arkansas, Box 4034
Wichita, Kansas 67204
316/832-9787

Winfield District Office
Room 418, Winfield State Bank Building
Winfield, Kansas 67156
316/221-7110

SE Regional Fish & Game Office
222 W. Main Building, Suite C & D
Chanute, Kansas 66720
316/431-0380

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Independence District Office
805 Crescent Drive
Independence, Kansas 67301
316/331-6820

Mound City District Office
Box 331
Mound City, Kansas 66056
913/795-2218

New Strawn District Office
Box 103
New Strawn, Kansas 66839
316/364-2282

Pittsburg District Office
Route 2, Box 372 AAA
Pittsburg, Kansas 66762
316/231-3173

SW Regional Fish & Game Office
808 Highway 56
Dodge City, Kansas 67801
316/227-8609

Cheyenne Bottoms Waterfowl Mgmt. Area
Route 3
Great Bend, Kansas 67530
316/793-7730

Garden City District Office
South Star Route
Garden City, Kansas 67846
316/276-8886

KANSAS WILDLIFE Magazine
A bi-monthly publication
available from the
Pratt headquarters.
$6.00 - 1-year subscription
$11.00 - 2-year subscription
$15.00 - 3-year subscription
(Prices subject to change.)

There are several other excellent sources of information on environmental topics available in Kansas and nationally. The organizations provide materials, speakers, or services on environmental education. This list is not complete. Make additions where appropriate.

Kansas Organizations

American Camping Association
Missouri Valley Section
4201 W. 15th Street
Topeka, Kansas 66604

Dillon Outdoor Education Center
3002 East 30th
Hutchinson, Kansas 67501

Environmental Education Curriculum Materials Center
Education Division
Farrell Library, Kansas State University
Manhattan, Kansas 66502

Great Bend Zoo
City Park
Great Bend, Kansas 67530

Kansas Academy of Science
Department of Biology
Emporia State University
Emporia, Kansas 66802

Kansas Advisory Council for Environmental Education
(Contact the State Department of Education
Science coordinator, or State and Extension
Forestry for information.)

Kansas Association of Conservation Districts
Route 1, Box 32
McPherson, Kansas 67460

Kansas Bass Chapter Federation
(Write to Kansas Fish & Game Commission
RR 2, Box 54A, Pratt, Kansas 67124
Fisheries Division for address of
current Youth Director.)

Kansas Canoe Association
2319 Terry Way
Manhattan, Kansas 66502

Kansas Energy Office
214 W. 6th
Topeka, Kansas 66603

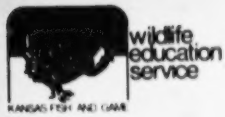
Kansas Geologic Survey
1930 Avenue A, Campus West
University of Kansas
Lawrence, Kansas 66044

Kansas Herpetological Society
Museum of Natural History
University of Kansas
Lawrence, Kansas 66045

Kansas Ornithological Society
Department of Biological Sciences
Fort Hays State University
Hays, Kansas 67601

Kansas Outdoors Unlimited
P. O. Box 470
Herington, Kansas 67449

The Kansas School Naturalist
Emporia State University
Division of Biological Sciences
Emporia, Kansas 66801



Kansas Water Office
Suite 503, Kansas Avenue
Topeka, Kansas 66603

Kansas Wildflower Society
c/o Washburn University
Mulvane Art Center
Topeka, Kansas 66621

Kansas Wildlife Federation
P. O. Box 720
Junction City, Kansas 66441

Lee Richardson Zoo
Finnup Park
Garden City, Kansas 67846

Museum of Natural History
University of Kansas
Lawrence, Kansas 66045

Sedgwick County Department of Environmental Resources
Historic County Courthouse
510 N. Main Street
Wichita, Kansas 67203

Sedgwick County Zoo
5555 Zoo Boulevard
Wichita, Kansas 67212

Soil Conservation Service
USDA
P. O. Box 600
Salina, Kansas 67401

State Biological Survey
2045 Avenue A, Campus West
Lawrence, Kansas 66044

State Conservation Commission
Room 1014, 535 Kansas Avenue
Topeka, Kansas 66603

State Department of Education,
Science, Math & Environmental Education
120 East 10th Street
Topeka, Kansas 66612

State Department of Health & Environment
Forbes Field, Building 740
Topeka, Kansas 66620

State Extension Services
Kansas State University
Umberger Hall
Manhattan, Kansas 66506

State and Extension Forestry
Kansas State University
2610 Claflin Road
Manhattan, Kansas 66502

State Park & Resources Authority
503 Kansas Avenue
P. O. Box 977
Topeka, Kansas 66601

Topeka Zoological Park
635 Gage Boulevard
Topeka, Kansas 66606

Wildlife Society Kansas Chapter
(Contact Kansas Fish & Game Commission,
RR 2, Box 54A, Pratt, Kansas 67124
for current president's address)

National Organizations

American Fisheries Society
5410 Grosvenor Lane
Bethesda, MD 20814

American Fishing Tackle Manufacturers Association
20 N. Wacker Drive
Chicago, IL 60606

American Forest Institute
1619 Massachusetts Avenue, N.W.
Washington, D. C. 20036

Boy Scouts of America
National Office
1325 Walnut Hill Lane
Irving, Texas 75062

Bureau of Land Management
U. S. Department of Interior
Washington, D. C. 20240

Center for Action on Endangered Species
175 West Main Street
Ayer, Massachusetts 01432

Center for Environmental Education
625 Ninth Street, N.W.
Washington, D. C. 20001

Ducks Unlimited, Inc.
P. O. Box 66300
Chicago, Illinois 60666

DU Kansas Regional Office
1004 West Ninth
Pratt, Kansas 67124
(check local chapter)

Environmental Protection Agency
401 M Street, S.W.
Washington, D. C. 20460

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KANSAS FISH AND GAME

ERIC Clearinghouse for Science, Mathematics, and Environmental Education
The Ohio State University
School of Natural Resources
1200 Chambers Road, 3rd Floor
Columbus, Ohio 43212

Forest Service
U. S. Department of Agriculture
P. O. Box 2417
Washington, D. C. 20013

The Garden Club of America
598 Madison Avenue
New York, New York 10022
(check local group)

Girl Scouts of the U.S.A.
830 Third Avenue
New York, New York 10022
(check local group)

Izaak Walton League of America
1800 North Kent Street, Suite 806
Arlington, Virginia 22209
(check local group)

National Association of Biology Teachers
11250 Roger Bacon Drive
Reston, Virginia 22090

Kansas Association of Biology Teachers
(Contact State Department of Education
Science Coordinator for current address.)

National Association for Environmental Education
P. O. Box 400
Troy, Ohio 45373

National Audubon Society
950 Third Avenue
New York, New York 10022

Kansas Regional Office
813 Juniper Drive
Manhattan, Kansas 66502
(check local group)

National Park Service
U. S. Department of Interior
Interior Building
Washington, D. C. 20240

National Science Teachers Association
1742 Connecticut Avenue, N.W.
Washington, D. C. 20009

State Chapter
Kansas Association of Teachers of Science
Contact: State Dept. of Education
Science Coordinator for information

National Shooting Sports Foundation
1075 Post Road
Riverside, Connecticut 06878

National Wild Turkey Federation
Wild Turkey Bldg., P.O. Box 530
Edgefield, South Carolina 29824

National Wildlife Federation
1412 16th Street, N.W.
Washington, D. C. 20036

The Nature Conservancy
Suite 800, 1800 N. Kent Street
Arlington, Virginia 22209

Natural Science for Youth Foundation
763 Silvermine Road
New Canaan, Connecticut 06840

Quail Unlimited
P.O. Box 10041
Augusta, Georgia 30906

Safari Club International
5151 E. Broadway, Suite 1680
Tucson, Arizona 85711

Sierra Club
530 Bush Street
San Francisco, California 94108
(check for local group)

Smithsonian Institution
1000 Jefferson Drive, S.W.
Washington, D. C. 20560

Soil Conservation Service
U. S. Department of Agriculture
P. O. Box 2890
Washington, D. C. 20013

Sport Fishing Institute
Suite 503
719 13th Street, N.W.
Washington, D. C. 20005

U. S. Fish and Wildlife Service
Department of the Interior
Washington, D. C. 20240

The Wilderness Society
1901 Pennsylvania Avenue, N.W.
Washington, D. C. 20006

Wildlife Management Institute
709 Wire Building
1000 Vermont Avenue, N.W.
Washington, D. C. 20005

The Wildlife Society
5410 Grosvenor Lane
Bethesda, Maryland 20814

wildlife education service

Glossary

Many of the terms below have been defined in the booklets or worksheets in the preschool through sixth grade units. Other words may come up in conversations with students or in your research. Check an ecology or biology book for further definitions and information. Definitions are taken from context of use in texts and the following sources:

Multidisciplinary Wildlife Teaching Activities, by William R. Hernbrode; *Project Learning Tree*, by the American Forest Institute, Inc.; and *The Random House Dictionary of the English Language, College Edition.*

ACRE—A unit of land equal to 43,560 square feet or 1/640 square mile.

ADAPT—To make suitable to environmental conditions; adjust.

AMPHIBIAN—Cold-blooded vertebrates that are covered with moist skin and live partially in an aquatic habitat and partially on dry land. This group includes frogs, toads, and salamanders.

ANNUAL TURNOVER—The rate of replacement of individual animals in a population. Bobwhite quail may have a 70 percent annual turnover. Only 30 percent of the birds alive at the beginning of the year are alive at the end of the year.

ANTLER—Bone-like growth on members of the deer family that falls off and grows back each year. Horns differ from antlers because they do not fall off each year. A few horned animals drop the outside sheath of the horn (such as antelope).

AQUATIC—Living or growing in water.

ARACHNID—Any arthropod in the class *Arachnida*. Includes spiders, scorpions, mites, ticks, etc.

BAG LIMIT—The number allowed to be harvested in regulated hunting and fishing. A hunter may remove four pheasants each day. This is a bag limit.

BIG GAME—Large, hunted animals, such as antelope and deer. Examples of small game are rabbits, squirrels, pheasants, quail, etc.

BIOME—A complex of communities characterized by a distinctive type of vegetation and maintained under the climatic conditions of the region.

BIOTIC COMMUNITY—The living organisms in a community. Includes all plants and animals in the community. The non-living parts would be the abiotic parts of the community.

BLIND—A hiding place for observing or photographing.

BOOMING GROUND—An area in the prairie used by prairie chickens for their mating dance. The male birds make a booming sound while they dance to attract females.

BOTTOMLAND—Low-lying land, usually near a river.

BOUNTY—An old practice of paying for removing certain animals. This was thought to be useful in reducing pest animals but proved to be impractical.

BROWSE—This word can be a noun or verb. Brushy vegetation used by animals as food (noun). To eat the twigs and leaves of woody, brushy plants (verb). Deer, elk, and moose are browsers.

BRUSH PILE—Branches and other vegetation piled together for wildlife cover.

BURROW—A hole or tunnel in the ground made by a small animal for habitation and refuge.

CAMOUFLAGE—Color and/or pattern that blend into the environment.

CARNIVORE—Meat eater.

CARRION—Dead animals in the process of decaying. Crows feed on carrion.

CARRYING CAPACITY—The number of animals of a species that can be supported in a particular habitat at any given time. This number will change with the season, and from year to year. It depends on competition from other animals, rainfall, and other weather factors.

CHANNELIZATION—Changes made to a river bed to straighten, widen, or deepen it. Used in land reclamation, and mistakenly used in flood control attempts but is very harmful to the river habitat.

CLASSIFICATION—The assignment of plants and animals to groups within a system of categories distinguished by structure, origin, etc.

CLEARCUT—A logging practice that removes all the trees in an area.

COLD-BLOODED—Describes animals that change body temperature to match their surroundings.

COMMUNITY—A group of plants and animals living in a particular location and interacting with each other.

COMPETITION—Struggle among organisms for food, space, cover, and other requirements for existence.

CONSERVATION—The wise use of natural resources to assure their presence in the future.

CONSUMER—Uses plants or animals as food. Eats producers. A primary consumer, such as a rabbit, eats plants. A secondary consumer, such as a fox, eats primary consumers.

COVER—Shelter provided by vegetation, debris, and irregularities of the land. Used by wildlife for sleeping, hiding, feeding, and breeding areas.

COVEY—A small flock or group. Quail are often found in a covey.

CRITICAL HABITAT—Includes the areas of land, water, and air space occupied by an endangered species at the time this species is listed. This habitat is classified by the federal government as being necessary for the species' survival.

CRUSTACEAN—Any chiefly aquatic arthropod of the class *Crustacea*. Usually has a hard shell or crust covering the body. Includes lobsters, shrimps, crabs, barnacles, etc.

DABBLING DUCKS—Ducks that live near shallow marshes, ponds, and rivers. They tip their tails up to feed, with the majority of their bodies above water. These ducks take off in vertical flight when startled. Also called "puddle ducks."

DECOMPOSER—Plants and animals that feed on dead material and cause it to mechanically or chemically break down. Examples include bacteria, fungi, and earthworms.

DEN—A secluded place, as the lair of a predatory animal.

DINGELL-JOHNSON FEDERAL AID IN FISHERIES RESTORATION ACT—D-J funds provide federal cost shares for fisheries projects. Funds provided by an excise tax on some fishing equipment.

DIURNAL—Active during the day. Opposite of nocturnal.

DIVING DUCKS—Ducks that prefer deep water as in lakes and bays. They feed by diving below the surface and take flight from a running start.

DOMESTIC ANIMALS—Animals of the home or farm, such as dogs, cats, chickens, etc.

ECOLOGY—The scientific study of the relations of living things to one another. A scientist who studies these relationships is called an ecologist.

ECOSYSTEM—A system formed by the interaction of a community of organisms with each other and their nonliving environment.

EDGE EFFECT—The tendency of wildlife to concentrate at the edges of two adjacent vegetative or land use types. The combination of habitats provides extra food and shelter.

ENDANGERED—Species that are in danger of becoming extinct throughout all or a significant portion of their range.

ENVIRONMENT—The total of all surroundings including air, water, plant life, people, and wildlife. Physical and biological factors included.

ESTIVATE (Aestivate)—To spend the summer in a torpid, or dormant, condition.

EXOTIC—In conservation terminology, this refers to a foreign plant or animal that has been introduced into a new area. The ring-necked pheasant is an exotic introduced to the U. S. from Asia.

EXTINCT—Species that no longer exist. Examples include passenger pigeon, great auk, and the sea mink.

EXTIRPATED—Describes species that were removed in a particular area but are found elsewhere. Mountain plover were extirpated from Kansas and have only recently been reintroduced.

FENCEROW—Vegetation growing along a fence. Often used by wildlife for cover.

FISH AND GAME COMMISSION—Organization that has responsibility for the wildlife and habitat in the state. Each of the 50 states has a similar organization.

FLYWAY—Flight routes used by migratory birds. Kansas is in the Central Flyway.

FOOD CHAIN—The sequence by which energy is passed from sun to plants to animals. A green plant is eaten by an insect that is eaten by a bird, forming a simple food chain.

FOOD WEB—An interconnection of food chains.

FORAGE—Used as a verb and a noun. Refers to vegetation taken by herbivores (noun). Act of taking the vegetation (verb).

FORBS—For wildlife use, forbs are weeds and herbs, low-growing annual or perennial herbaceous plants.

GAME—Animals that can legally be hunted, fished, or trapped.

GENUS—Used in plant and animal classification as the subdivision of families or subfamilies. A genus usually has more than one species. The genus *Canis* includes dogs, wolves, coyotes, etc.

GRANIVORE—Grain eater.

HABITAT—The place in which an animal lives. It must include food, water, and cover. This involves escape cover, winter cover, cover to rear young, and space to play. Loss of habitat is the biggest single threat to wildlife.

HARE—Rodent-like mammals of the genus *Lepus* having long ears, a divided upper lip, and long hind limbs adapted for leaping. Distinguished from rabbits by having young that leave the nest in 24 to 48 hours. Hares are generally larger than rabbits. Jack rabbits are hares.

HERBIVORE—Plant eater.

HIBERNATE—Spending winter, or a portion of it, in a state of sleep; a torpid or resting state.

HUNT—To search for game animals for the purpose of catching or killing. Hunting is now regulated under comprehensive laws in every state. Sport hunting removes the surplus of wildlife as opposed to market hunting in pioneer days when nearly all edible or useful forms of wildlife were taken almost without restriction.

INTERACTION—The relationship of one organism to another. The action of one population affecting the growth or death rate of another population. One population may eat members of other populations, compete for food, etc. Interactions can be positive, negative, or neutral.

INTERDEPENDENCE—The interrelationships of wildlife with one another and with the various elements of their environment.

INTERSPERSION—Mixing of habitat types. Interspersion of habitat creates edge.

INVERTEBRATE—Animal without a backbone.

KINGDOM—A province of nature. The animal, vegetable, and mineral kingdoms.

LARVA—Immature, wingless, feeding stage of an insect that undergoes complete metamorphosis. Also, the young of any invertebrate.

LIFE CYCLE—The continuous sequence of changes undergone by organisms from one primary form to the development of the same form in a subsequent generation. Immature animals grow, reproduce, and leave more immature animals, defining the species' life cycle.

LIMITING FACTOR—Anything that controls the density of a population within its habitat. Factors include the quality and/or quantity of food, water, cover, predators, disease, and climate.

MAMMAL—Any vertebrate of the class *Mammalia* including humans. All members of this class have hair on their bodies and feed their young milk.

MARSH—A tract of low wetlands generally supporting cattails and other reeds, muskrats, mink, red-winged blackbirds, and a wide variety of other species.

MICROCLIMATE—The environmental conditions in a restricted area. A shady area of cottonwoods in the sunny prairie may create a microclimate.

MIGRATORY—Birds and other animals that make an annual trip to a different area. Distance may be long or short, depending on the species. Sandhill cranes migrate through Kansas on their way to Texas for the winter and Canada for the summer.

MIMICRY—The close external resemblance of an animal to another animal or its surrounding. Often serves as protection or concealment. Imitate; simulate.

MOLLUSK—Any invertebrate of the phylum *Mollusca* comprising the chitons, snails, bivalves, squids, octopuses, etc. Typically have a hard shell.

MOLT—To shed worn feathers or skin so they can be replaced, or to lose one seasonal coat so it can be replaced by another.

MONOCULTURE—Vegetation of a single species, generally even-aged. This situation allows for little wildlife diversity and is potentially dangerous because it is more susceptible to disease.

MORTALITY RATE—The relative frequency of death in a community.

MUTUALISM—A close association between two different species whereby each species gains some benefit.

NATALITY RATE—Rate of birth.

NATIVE SPECIES—An animal or plant indigenous to a particular region.

NATURAL SELECTION—Process resulting in the survival and perpetuation of only those forms of plant and animal life that are able to adapt to the environment.

NOCTURNAL—Active at night; opposite of diurnal.

NONGAME—Animals that are not hunted, fished, or trapped; this includes the threatened and endangered species, song birds, etc.

NONRENEWABLE RESOURCES—Resources, such as soil and minerals, which cannot be regenerated by themselves.

OMNIVORE—Animal that eats both plants and animals.

ORGANISM—A form of life composed of mutually dependent parts that maintain various vital processes; any form of plant or animal.

PARASITE—An animal or plant that lives on or in an organism of another species from whose body it obtains nourishment.

PESTICIDE—Chemical preparation used to control populations of organisms.

PHOTOSYNTHESIS—The process by which green plants convert carbon dioxide and water into simple sugar. Chlorophyll and sunlight are essential to the series of complex chemical reactions involved.

PHYLUM—The major subdivision of the animal kingdom, consisting of one or more related classes.

PITTMAN-ROBERTSON FEDERAL AID IN WILDLIFE RESTORATION ACT—Funds gathered from an excise tax on sporting arms and ammunition for wildlife management and research use. A cost-sharing program of the federal government with the states.

PLANKTON—Organisms (usually microscopic) suspended in aquatic habitat. Includes bacteria, algae, protozoans, rotifers, etc. Phytoplankton are the plant plankton; zooplankton are the animal species.

POLLUTION—Harmful substances deposited in the air, water, or land which lead to a state of impurity and, often, unhealthiness.

POPULATION—All the individuals of a particular species in a given area.

PREDATOR—An animal that hunts other animals for its food.

PRESCRIBED BURNING—Planned application of fire to a predetermined area. A technique used in wildlife management to gain regrowth of certain vegetation.

PREY—Animals that are hunted for food by other animals.

PRODUCER—Organisms eaten by consumers. Green plants are primary producers; they are able to make food from sunlight and organic substances.

PRONGHORN—The proper name for the American antelope, *Antilocapra americanus*. Not a true antelope; does not have true horns. Pronghorns belong to a family by themselves. They are not found outside of North America.

RANGE—(a) Home range: the geographic area in which an individual animal resides. (b) an area grazed by livestock and/or wildlife. (c) all lands including forest land that produce native forage, in contrast to land cultivated for agricultural crops or carrying a dense forest.

RAPTOR—Bird of prey, such as eagles, hawks, and owls. Predatory birds.

RECYCLING—The salvage and reprocessing of used materials, such as paper, glass, and aluminum.

REFORESTATION—The replanting of trees in forests that have been affected by cutting, fire, disease, etc.

REFUGE—A wildlife sanctuary. National wildlife refuges are located across the United States. Kirwin, Quivira, and Flint Hills NWR are in Kansas.

REINTRODUCTION OF SPECIES—A wildlife management technique in which a species is reintroduced into its historic range, replanted in areas where it was extirpated.

RENEWABLE RESOURCES—Resources, such as trees and wildlife, that renew themselves naturally.

REPTILE—Any cold-blooded, scaled vertebrate of the class *Reptilia*, including turtles, lizards, snakes, and crocodiles.

RESERVOIR—A place where water is collected and stored for use. Kansas has approximately 25 reservoirs, such as Cheney, Wilson, and Clinton.

RESIDENT WILDLIFE—Animals that are residents of a specific area on a year-round basis, as opposed to migratory.

RIPARIAN—Dwelling on the bank of a river or other body of water. Riparian habitat is situated along a river.

RIPRAP—A quantity of stone placed in water for fish cover, and to prevent bank erosion.

ROADSIDE DITCH—Areas bordering roads; can be excellent for wildlife habitat if they are left to grow and have diverse vegetation. Too often, these areas are mowed and their use to wildlife reduced or removed.

RODENT—A gnawing or nibbling mammal, including mice, squirrels, and rabbits. Animals in the order *Rodentia*.

SACS—The baglike structure in an animal or plant. The prairie chicken has orange sacs on the sides of its neck.

SCAVENGER—An animal that eats the dead remains and wastes of other animals and plants. Dermestid beetles are scavengers.

SEASON (OPEN SEASON)—In wildlife terminology, season refers to a time when hunting and fishing is permitted for a particular species. May be a few days or year-round.

SEDGE—A rush or grass-like plant growing in wet places; sawlike edge to blade of plant.

SHELTER—Cover; cover from elements for raising young, to travel in, for breeding, sleeping, etc. Varies by species.

SHELTERBELT—Rows of trees and shrubs generally on the north and west sides of farms, homes, or fields; protects from weather and provides wildlife habitat.

SKINK—Any of a family of small, smooth-scaled lizards.

SLOUGH—An inlet from a river; backwater; tide flat, a creek in a marsh.

SMALL GAME—A hunting term designating smaller hunted species, such as rabbits, squirrels, quail, etc. Compare with "big game."

SPECIES—A group of individuals that resemble one another and are able to breed among themselves but not able to breed with members of another species. A category of biological classification immediately below the genus or subgenus. Species is both singular and plural.

STEWARDSHIP—The concept of land responsibility--that we do not own land but are managers of the resource and responsible to future generations for the condition of the land when we leave it.

STRESS—Usually thought of as a physical factor that applies to detrimental pressure to an organism or population. A drought might stress an animal population possibly resulting in inhibited reproduction.

SUCCESSION—The orderly, gradual, and continuous replacement of one plant or animal by another. A bare field will gradually develop into a woodland if not disturbed by fire, mowing, etc.

SURPLUS—That quantity of wildlife above the carrying capacity. The surplus is removed by disease, starvation, hunting, or predation.

TALON—A claw from a bird of prey.

TERRITORY—An area defended by an animal against others of the same species. Used for breeding, feeding, or both. Wolves are territorial.

THREATENED—Species of plants and animals that are protected by law and are limited in number or range or both. May become endangered if reduction continues.

UNGULATE—A hoofed mammal.

UNITED STATES FISH AND WILDLIFE SERVICE—The federal organization responsible for wildlife on the national level. This organization sets standards and gives guidance to the state wildlife agencies.

UPLAND—The higher ground of a region; above the level where water flows. Upland game animals include prairie chicken, turkey, pheasant, quail, etc.

VERTEBRATES—Animals with backbones.

WARM-BLOODED—Animals that are able to maintain a fairly constant body temperature independent of their environments, as opposed to cold-blooded animals.

WATERFOWL--Water birds; usually ducks and geese but may be used in referring to shore birds and wading birds as well.

WILDFIRE—Any fire other than a controlled or prescribed burn occurring on wild land.

WILDERNESS AREA—An area established by the federal government to conserve its primeval character and influence for public enjoyment under primitive conditions in perpetuity.

WILDLIFE—All wild, living animals. Includes birds, fish, mammals, reptiles, amphibians, insects, mollusks, crustaceans, etc. Occasionally, the term is even applied to plants. Game and nongame animals are wildlife.

WILDLIFE MANAGEMENT—An effort based on the science of ecology and designed to maintain wildlife at certain population levels. This effort entails habitat manipulation and an understanding of wildlife population dynamics, diseases, behavior, and reproduction. This is done by wildlife managers working for the Fish and Game Commission and by other interested individuals and groups.

WILDLIFE RESEARCH—Investigating wildlife to gain information that can be used to better manage wildlife. Examples of projects might include taking a survey or census of populations, gathering and analyzing data about animal behavior, and studying and comparing the interaction of wildlife within habitats.

ZOOLOGY—The study of animals; a branch of biology.

This program was funded from hunting and fishing license fees and partially by the Nongame Wildlife Tax Check-Off Program.

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EQUAL OPPORTUNITY EMPLOYER

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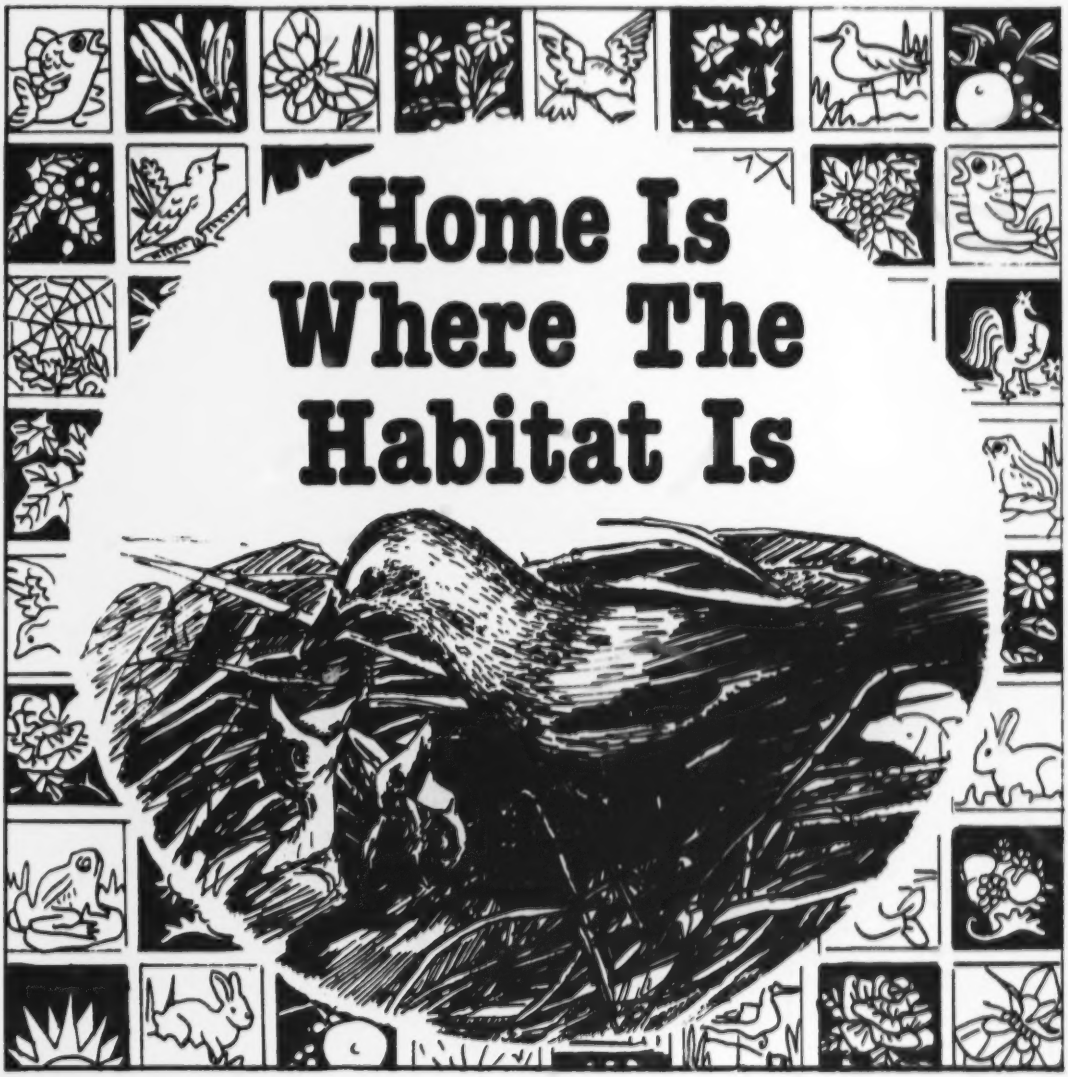
KANSAS FISH AND GAME



Home Is Where The Habitat Is

Student Manual

wildlife education service

KANSAS FISH AND GAME

NONCONSUMABLE

6

Comprehensive program written and developed by

JOYCE R. HARMON

Wildlife Education Coordinator

Design and Illustration by
Mike Miller

wildlife education service
KANSAS FISH AND GAME

Wildlife Education Service
A series of wildlife education materials for Kansas youth
from the Kansas Fish & Game Commission

The elementary series includes:

Preschool-Kindergarten	WILDLIFE IS BASIC
1st grade	WILDLIFE AND ME
2nd grade	FOOD FOR WILDLIFE
3rd grade	WILDLIFE NEEDS A PLACE TO LIVE
4th grade	ENDANGERED, OR ALIVE AND WELL LIVING IN KANSAS
5th grade	HOW DO WE GROUP WILDLIFE
6th grade	HOME IS WHERE THE HABITAT IS

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Kansas Fish and Game Commission
Box 54A Route 2
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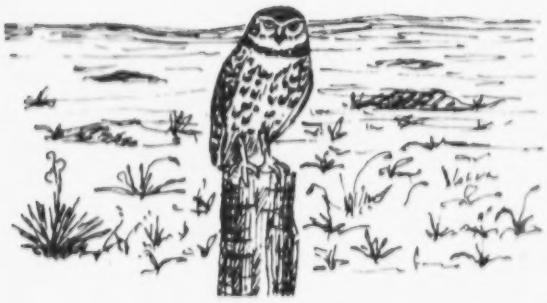
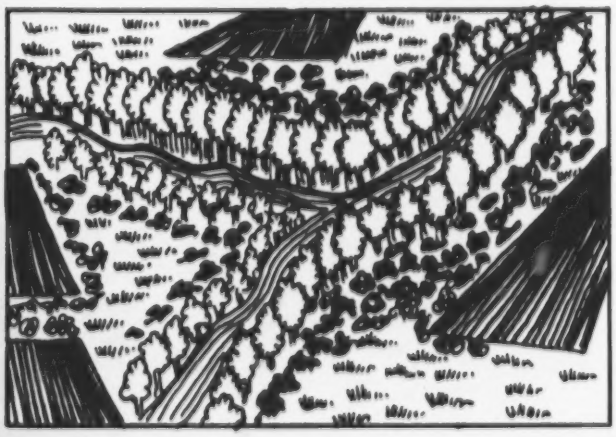
HOME IS WHERE THE HABITAT IS

Kansas is fortunate to have a wide variety of wildlife. **Wildlife** means all wild, living animals. We know wildlife needs habitat to live and the state has a variety of that, too.

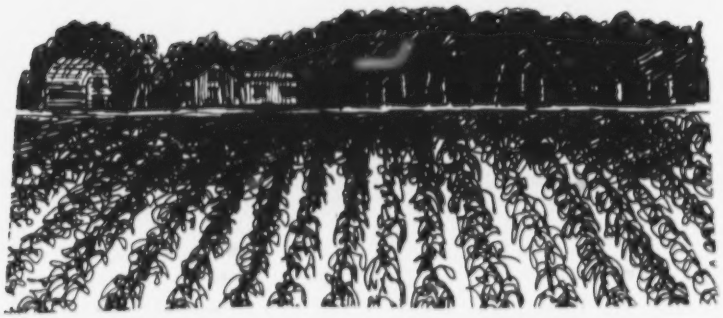
Habitat is where an animal lives. It includes all the things an animal needs to stay alive and healthy. A burrowing owl's habitat is the prairie, and the habitat of a muskrat is the marsh. Your habitat is your home, school, neighborhood and all the other places you spend time in.



Animals need several things from their habitat – **food, water,** and **shelter** (or **cover**) for protection from predators and weather and for raising young. They also need **space** to move, rest and play in. All of these must be close enough together for the animal to safely use. If the food supply is too far from shelter, the animal is likely to be caught by a **predator** (an animal that kills other animals for food). During the winter, the animal may also burn too much energy traveling from food to shelter. If the distance is too great, the animal may starve.

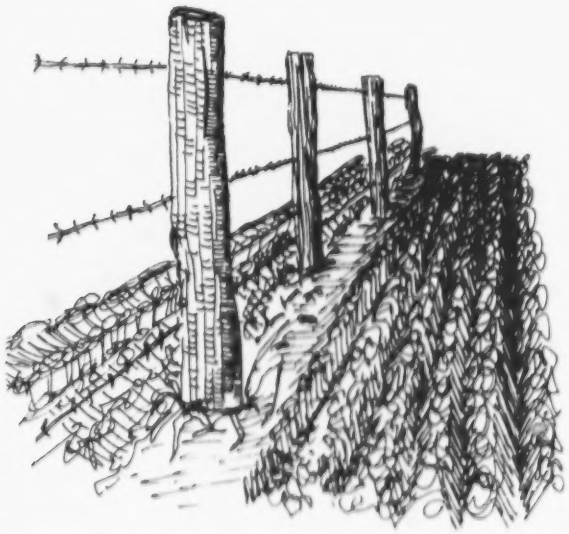


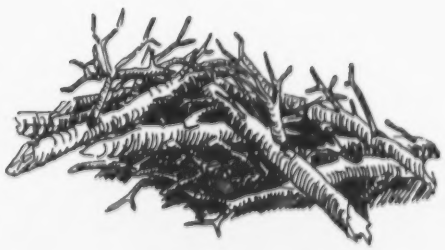
A patchwork arrangement of different kinds of habitat is called **interspersed** habitat. The **edges** along the boundaries of the habitats combine food and shelter from each one and offer wildlife a richer place to live than any single habitat can provide. This is called the **edge effect**. A wide variety of **species** (kinds of animals) can survive at an edge. **Diverse** (many different kinds) habitat usually results in diverse wildlife.



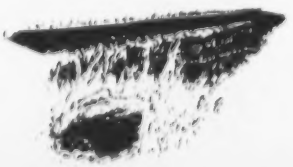
When you drive past farms, you can often see a **shelter belt** on the north and west side of the farm buildings and next to some crop fields. A shelter belt protects the farm and fields from wind and weather. It also makes a home for wildlife. The edge between fields and the shelter belt is an especially important habitat. Farmers make shelter belts by planting rows of trees and shrubs.

Many farmers also leave wildlife an edge when they do not plant crops up to the fence. Leaving that small strip of grass or shrubs near the field edge helps wildlife. The **fence row** is used by many nesting birds like pheasants, quail, vesper sparrows, lark buntings—the list is endless. Mammals,such as rabbits, kangaroo rats, deer, mice, and woodchucks, along with reptiles and insects, also use the fence row. It gives them a home and food close by. Farms that are plowed to the edge of the fence or have unfenced fields reduce the amount of wildlife that can live there. The crops that are raised are **valuable** to the farmer but the wildlife is also valuable.





Brush piles also give wildlife shelter from predators. **Prey** animals that are eaten by predators hide there. Brush piles are made when branches are stacked together. Ditches along the roads that are not mowed are also great nesting sites and hiding places for animals. Check **roadside ditches** to see what wildlife uses them.



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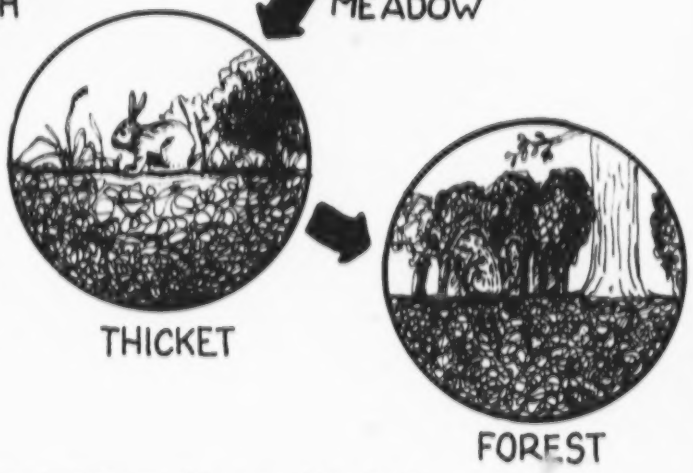
Not only is the arrangement of habitat important, but so is the **quality** and **quantity** of the habitat. Some animals can live close to each other, but others need much more space. If they are too crowded, some animals may die of starvation or disease. The number of animals that a habitat can support at one time is called the **carrying capacity**. Carrying capacity changes with the season and from year to year. A woodland may be able to handle more deer in the spring and summer than in the winter because the food supply is reduced in winter. The habitat also changes through the years because of the amount of rainfall, competition from **domestic** animals like grazing cows, and the natural aging process habitat goes through.

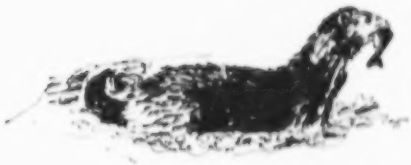
All habitats gradually undergo continual change. This natural change is called **succession**. A **lake** can gradually fill in with silt to become a **marsh**, and further change to a **meadow**. The meadow will grow up with shrubs to make a **thicket** and eventually advance to a **forest**. As the habitat changes, so does the wildlife that lives there. The plant life in each stage is suitable for different animals. Muskrats thrive in a cattail marsh but not in a pine forest. The quantity, quality and arrangement of food, shelter and water have been changed.

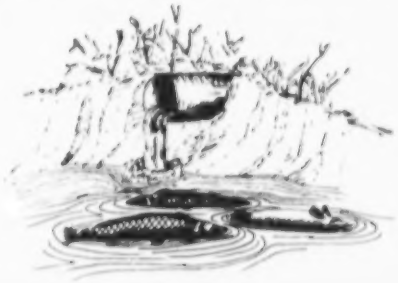


The speed of succession can be influenced in a number of natural and unnatural ways. **Fires**, insects and disease can slow succession. People can also plant different types of vegetation, set fires, cut trees, or bulldoze an area, resulting in a changed habitat. Wildlife managers may also use these techniques to improve the habitat for wildlife.

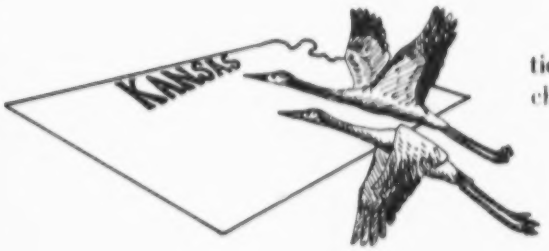
Succession isn't the only reason that animal populations change. A **population** is the number of animals of one species in a habitat. That number changes when animals die, are born, or when other animals move into the area.

The death, or **mortality**, factors include starvation, predation, disease, pollution, harsh weather, accident, hunting, and old age. All of these will limit the number of possible animals in a habitat.



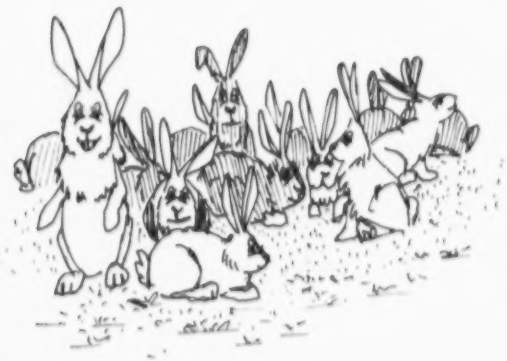


The birth, or **natality**, rate depends on habitat conditions and the species **reproduction** factors, such as how many young it has each year, when it's old enough to have young, and when it stops having young. The details get confusing, but a wildlife biologist must know all of this to properly manage wildlife.

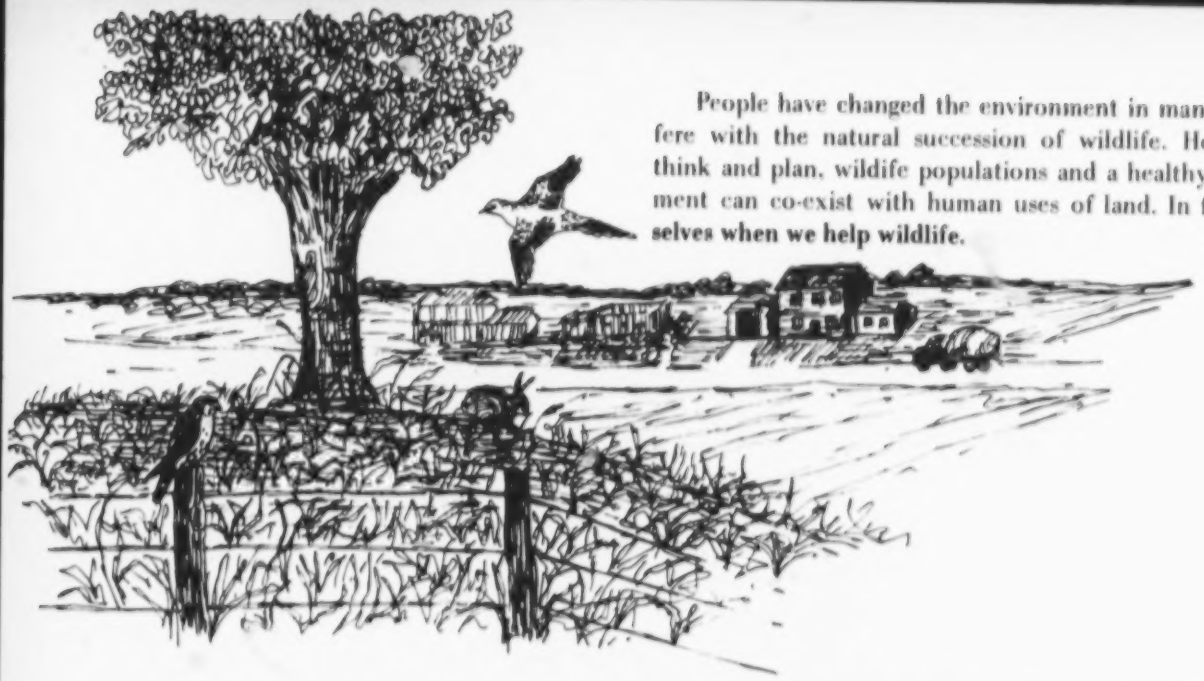


Animals may move into an area for a short time during **migration**, or may move in permanently because of crowding or other changes in their original habitat.

We do not usually need to worry about any one animal in the population. The loss of one animal does not mean that the entire population is **extinct** or **endangered**.

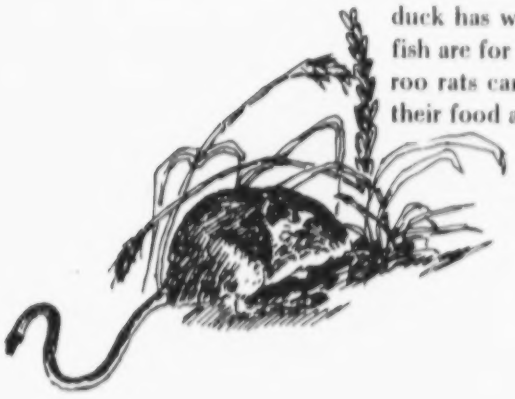


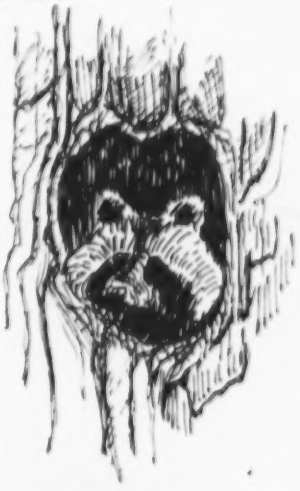
Nature produces more individuals than can survive. Wildlife can not be stockpiled like food or clothes. The extras, or **surplus**, are food for predators, are hunted or die from other causes. If the surplus survived, it would damage the habitat for other species. Too many rabbits would eat plants that other plant-eaters, or **herbivores**, need. They would eat themselves out of a home without some control from the meateaters, or **carnivores**.



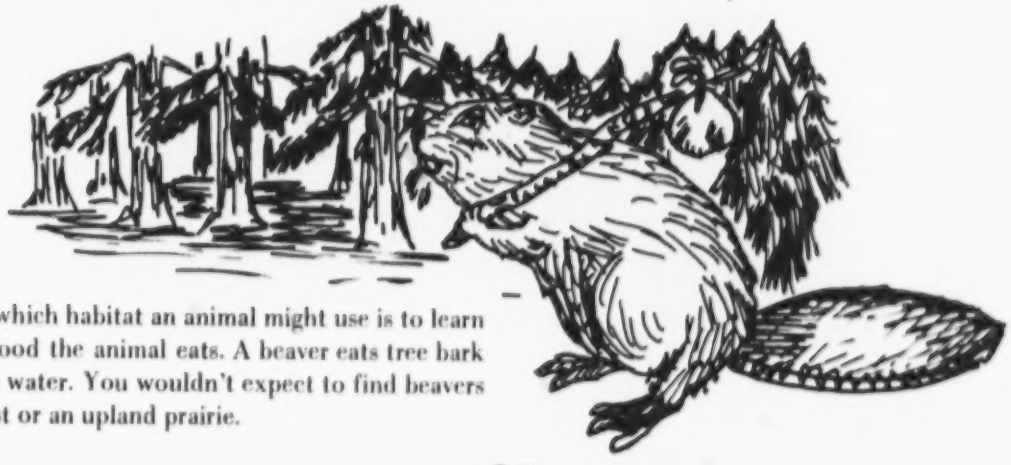
People have changed the environment in many ways that interfere with the natural succession of wildlife. However, when we think and plan, wildife populations and a healthy, natural environment can co-exist with human uses of land. In fact, **we help ourselves when we help wildlife.**

We know that animals are **adapted** for the habitat they live in. A duck has webbed feet to help with life in or near water. The fins on fish are for swimming and the gills for underwater breathing. Kangaroo rats can survive in dry habitats because they get moisture from their food and need little, if any, drinking water.





Some animals can survive in only one habitat. Others are confusing because they are adapted to life in more than one habitat. Raccoons eat almost everything **(omnivores)**, so they can be found in many places. A raccoon may den in the forest and hunt for food in a marsh.



One way to decide which habitat an animal might use is to learn which habitat has the food the animal eats. A beaver eats tree bark and is adapted to life in water. You wouldn't expect to find beavers living in a dry pine forest or an upland prairie.

Review what you have learned so far, and apply it to these species.

See how much you can find out about Kansas wildlife and habitats in the state. Here are some of the species of wildlife. They are in six groups to help make your study easier.

BIRDS

scissor-tailed flycatcher

Canada goose

meadowlark

prairie chicken

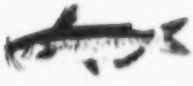
MAMMALS

coyote

jack rabbit

badger

FISH



channel catfish

white bass

striped bass

walleye

REPTILES

ornate box turtle

bull snake

collared lizard

INSECTS

red admiral butterfly

green darner

mud dauber

AMPHIBIANS

tiger salamander

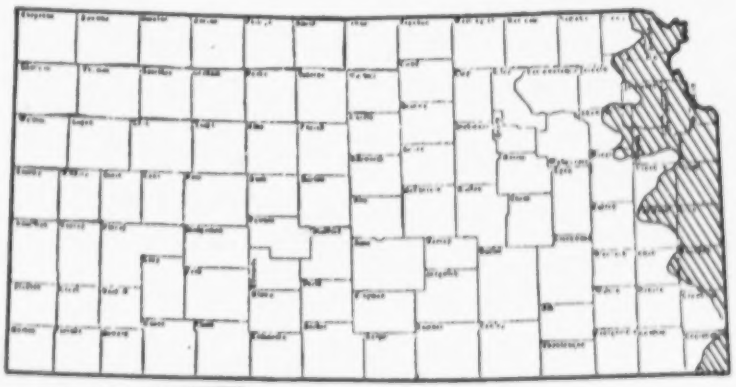
Great Plains toad

western chorus frog

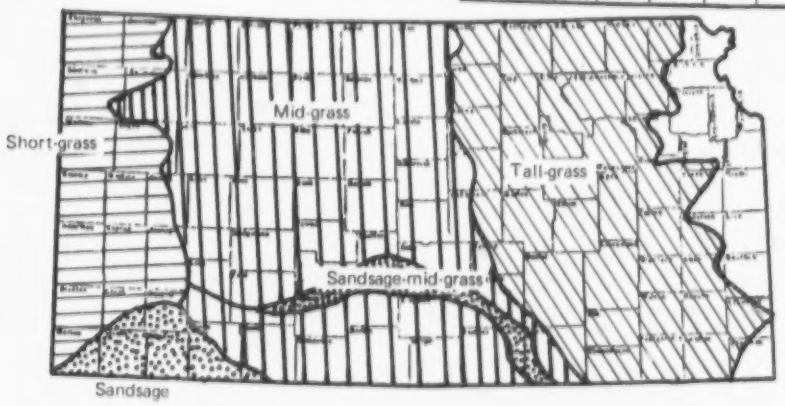
Kansas Habitats

The main kinds of habitat we have in Kansas are: **forests**, tall, mid and short grass **prairies, marshes, lakes, streams, rivers**, and **reservoirs**. The maps below show where each of these kinds of habitat are found in the state.

FOREST



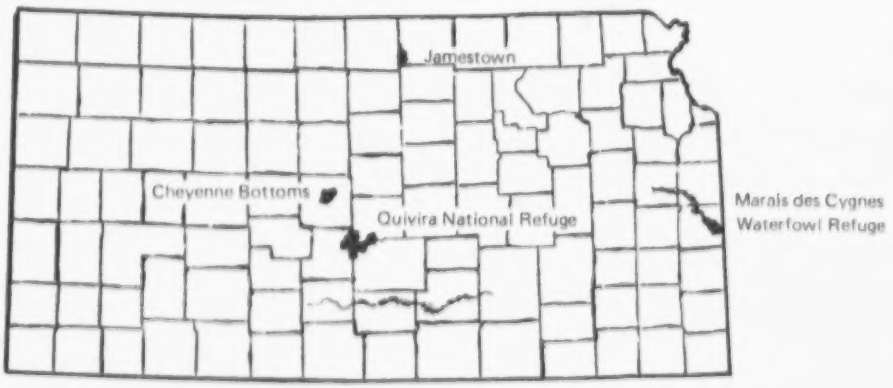
Woodlands are also found along most Kansas rivers, called **riparian** habitat.

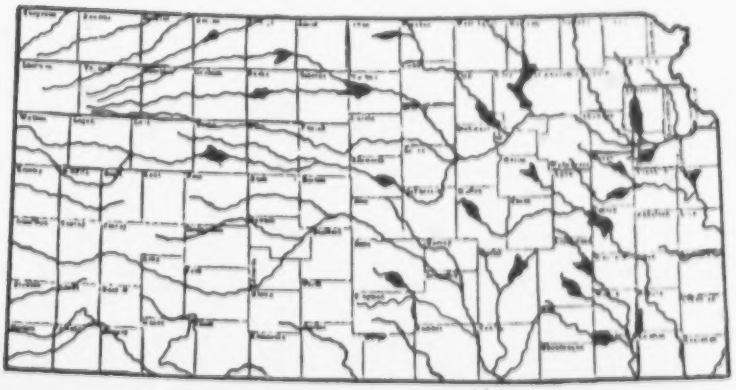


PRAIRIE

MARSHES

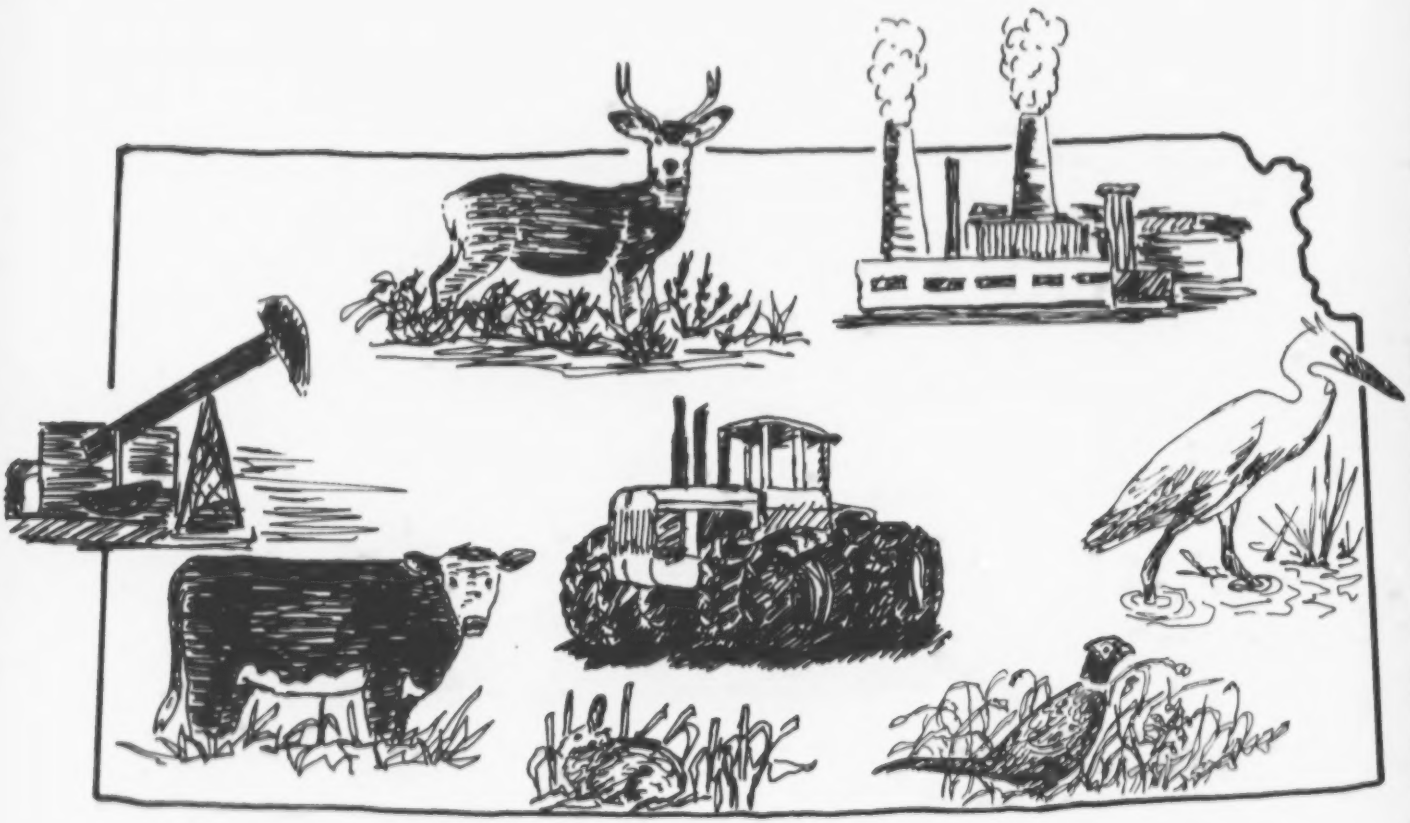
There are marsh areas along some of the rivers in Kansas as well as on reservoirs, lakes, and private land that aren't marked on this map.





RIVERS, STREAMS, LAKES, RESERVOIRS

A majority of Kansas is prairie. Tall grass prairie is found in the east, midgrass in the central part of the state and shortgrass in the west. Rainfall and soil determine the kind of prairie. In what type of habitat would you expect to find the greatest variety of species?



The natural vegetation of Kansas has been changed by people. Building construction, industry, mining, and farming are a few of the ways we have changed the habitat. Careful land use practices should be used in urban and rural areas. Land used for housing development is no longer available for farming or wildlife. Other land is then put into crop production, leaving less quality wildlife habitat. This is a dangerous pattern. Increasing populations means more space will be needed for people to live, play, work, and grow food. Urban areas can be designed with wildlife in mind. Golf courses, parks, cemeteries, and backyards can be made suitable for some wildlife. We must learn to consider the impact we have on the environment before we make changes in the land. Certain changes are natural and desirable; other changes damage the environment and make it a less enjoyable place in which to live.

Much of Kansas has been farmed, changing the habitat that was originally here. Farming is important for the economy of Kansas and also an important source of food for people. Farming and wildlife management can work together for a better Kansas—all people are responsible for the **conservation**, or wise use, of all natural resources. The future will be better if we think before we act. An economically strong and healthy state with a wide variety of wildlife is a better Kansas for all. HELP YOURSELF BY HELPING WILDLIFE! After all, people depend on habitat, too—home is where the habitat is.

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WHAT YOU CAN DO TO LEARN MORE ABOUT WILDLIFE

1) Pick one of the animals you see in this booklet and research it. Find out what the animal eats, where it lives, where you would find it in Kansas and any other interesting information about the animal. Use pages 6 and 7 to help in your study.

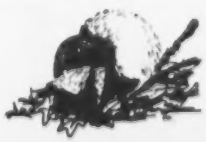
2) Investigate the wildlife where you live. Explore the kinds of habitat that are around you. What animals (large or small) do you find in each habitat type? Do some animals use more than one habitat? How are the animals adapted for the habitat?

3) Scientists use the term "edge effect" to describe wildlife's use of habitat. What do you think edge effect means? Why is it important to have an edge for wildlife?

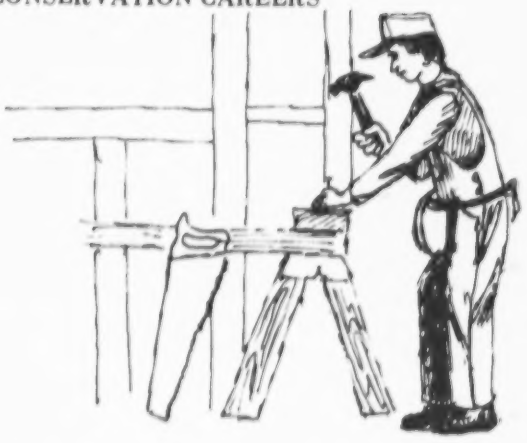
4) You can help wildlife by making sure there is habitat.
   a) Plant trees and shrubs that make good wildlife food and shelter. Be sure to take good care of the new plants until they are well established.
   b) Make or buy bird houses and bird feeders for your yard or school ground. Bird feeders should be refilled regularly during the winter so that the birds that depend on you do not go hungry.
   c) If you know people who are changing the land, see if you can help by making changes beneficial for wildlife. You can make a difference by knowing as much as possible about wildlife and sharing the information with others.
   d) If you live near an area where new building construction is going on, see what happens to the wildlife in that area. Keep a "before" and "after" record on the site. What changes in the amount and kinds of wildlife do you see? How do you feel about the changes?
   e) Wild animals sometimes leave clues that they have been in a habitat. You may find tracks, droppings, bones or marks made by teeth. You can make plaster casts of tracks and display your collection.

5) What do you think would happen if all the wildlife that was ever born were still alive? What would the habitat look like if all animals lived? Do you think it is important to have death be a part of the system? Why?

6) Work and talk with a local farmer to better understand farming land use practices. Make a list of the conservation practices you see in use (fence rows, brush piles, shelter belts, contour plowing, no-till or minimum tillage farming, etc.) Compare the fields that are being farmed with conservation in mind to those whose owners ignore conservation. What differences do you see in wildlife variety, erosion and look of the land? Which farming techniques would you use? How has the variety of wildlife changed in Kansas since farming began on a large scale?



TOOLS OF THE TRADE – WILDLIFE CONSERVATION CAREERS



Carpenters use hammers, saws, and nails to help complete their projects. Teachers use books, films, and chalk to get ideas across to their students. Dentists use drills, special chairs, and x-rays to help their patients.

All **professionals** have unique tools that help them accomplish their tasks. Wildlife biologists also have tools that help them manage wildlife and the plants that make up wildlife habitat. Some of the tools, such as shovels, are very common. Other tools are in the form of work plans which are used on wildlife management areas.

People who have **careers** in wildlife conservation may work in one of several areas. Jobs in the wildlife profession may deal with law enforcement, research, management, information and education, planning, or administration. Each of these areas is very important. They all work together toward the conservation goals.

The job descriptions below give an idea of some of the work involved in conservation and the tools required to do a good job. A close look shows that some special skills are needed to do the work involved in wildlife conservation.

Communication skills are essential for any kind of wildlife work. The ability to speak and write clearly is very important, as is an understanding and respect for wildlife. Wildlife professionals need to be able to inform the public about what should be done to effectively manage wildlife. Without public support, wildlife professionals can not achieve their management goals. Getting along with people is very important in any career.

Wildlife law enforcement officers are called game protectors in Kansas. Their job is to conserve wildlife through education and law enforcement. State laws and regulations dealing with hunting, fishing, and boating are enforced across the state by game protectors. These professionals get to know the people in their areas, and they are called upon to speak to students, sportsmen groups, and the general public. They also help with projects from other Fish and Game programs, such as collecting data for surveys, assisting with habitat restoration projects, and helping with the wildlife education program.

Law enforcement officers try to prevent laws from being broken by helping people understand the reasons for laws and regulations. Laws are important to protect wildlife resources for everyone. They also help to assure that people enjoy outdoor activities safely.

Game protectors are required to attend the Law Enforcement Training Center in Hutchinson. They also receive training from an experienced game protector who teaches them the Fish and Game Commission's policies. Game protectors must attend periodic training sessions to keep their knowledge and skills up-to-date. Law enforcement personnel need to have knowledge of wildlife and the laws that pertain to natural resources. Law enforcement is an important part of wildlife conservation. Talk to your local game protector to find out more about the job.

Wildlife biologists are responsible for research and management activities. These scientists perform such a variety of tasks that it's impossible to list all of them. They conduct wildlife surveys so that changes in size or make-up of populations can be monitored. Another part of their job is to work with landowners to develop wildlife habitat on private land.

Habitat improvement projects are very important. Biologists may plant wildlife food and cover plots to improve habitat in an area. Game biologists sometimes use fire to clear an area, so that desirable plants grow.

Fisheries biologists use large nets to sample fish populations. Sampling gives them information used in management. They also stock certain species of fish in order to maintain balanced populations of predators and prey.

Biologists take samples, and conduct tests to gain information about the quality of water and soil. These tests can show the nutrients in the water and soil.

Not all of the biologist's work is done outside. Making plans for future projects and keeping reports up-to-date requires much of the biologist's time. Reports are important tools for keeping records about the condition of wildlife populations and wildlife habitat.

Biologists earn college degrees in fish or wildlife biology. They receive training in wildlife management techniques, ecology, research, and conservation. After they have gained experience, some biologists become supervisors who are responsible for the work of the biologists in their region of the state.

With such a variety of projects, it's easy to see how important and interesting the job of a wildlife biologist can be. Learn more about a career in wildlife from the biologist who works in your area.

Some careers in wildlife conservation deal with information and education. These professionals work with television, radio, newspapers, school materials, and many other tools to teach people about wildlife. Wildlife information representatives may help to write and take pictures for the KANSAS WILDLIFE magazine. They also give public talks and answer questions about wildlife.

Planners for Kansas Fish and Game help to prepare for the future of wildlife management in the state. They work with biologists to assure that future generations will have plenty of wildlife to enjoy.

Administrators are people with a great deal of experience in wildlife biology, who coordinate and supervise the biologists, game protectors, and other field personnel.

The Kansas Fish and Game Commission also employs engineers, accountants, and computer operators. With such a variety of jobs to do, wildlife management is a very exciting field to work in. You can learn more about careers in wildlife management from your local Fish and Game personnel.

VOCABULARY

Find these words in the text and review their meanings.

wildlife
habitat
food
water
shelter
cover
space
arrangement
predator
prey
interspersed
edge
edge effect
species (both singular and plural)
diverse
shelter belt
fence row
brush pile

quality
quantity
carrying capacity
domestic
succession
lake
marsh
meadow
thicket
forest
fire
population
mortality
natality
reproduction
migration
extinct
roadside ditches

endangered
surplus
herbivore
carnivore
omnivore
adapted
starvation
disease
professionals
careers
surveys
nutrients
reservoir
prairie
rivers
riparian
conservation

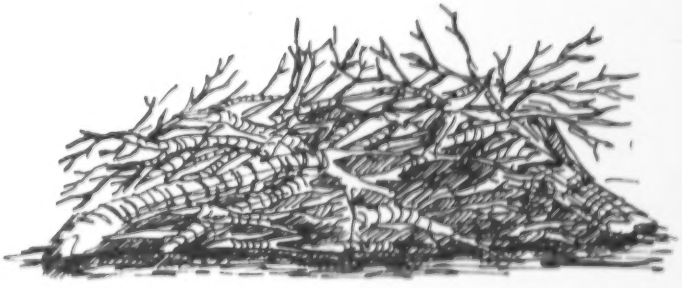
WILDLIFE MANAGEMENT TECHNIQUES

Can you label each illustration with the correct management technique?

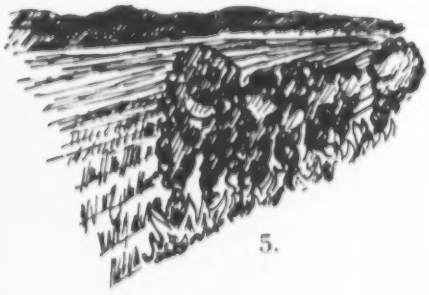
1.

2.

3.

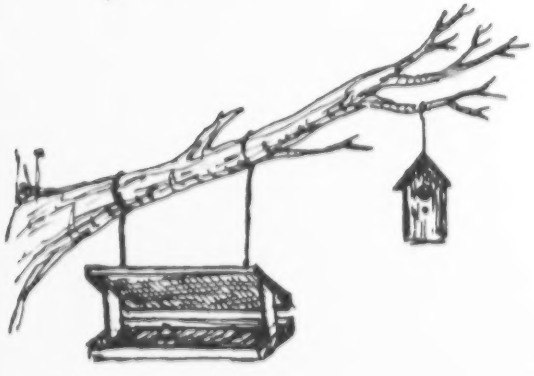


4.



5.

6.



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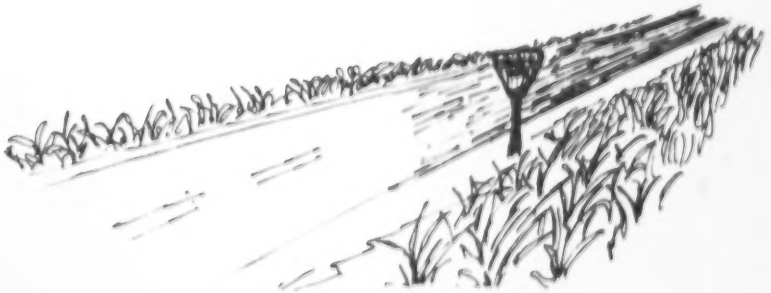

8.

1. edge effect 2. shelter belt 3. fence row 4. brush pile
5. burning 6. planting 7. bird feeder and house 8. roadside ditch

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